



Contents

Foreword ^{p2} / Preface ^{p3} / Overview ^{p4} / Current initiatives ^{p12} / Challenges and way forward ^{p25} / International examples ^{p28} / Sources ^{p32} / Glossary ^{p36} / FICCI Security Department ^{p38}

Smart border management: Indian coastal and maritime security

September 2017



www.pwc.in

Foreword

1



Dr Sanjaya Baru
Secretary General
FICCI

A handwritten signature in black ink, appearing to be 'Sanjaya Baru'.

India's long coastline presents a variety of security challenges including illegal landing of arms and explosives at isolated spots on the coast, infiltration/ex-filtration of anti-national elements, use of the sea and off shore islands for criminal activities, and smuggling of consumer and intermediate goods through sea routes. Absence of physical barriers on the coast and presence of vital industrial and defence installations near the coast also enhance the vulnerability of the coasts to illegal cross-border activities.

In addition, the Indian Ocean Region is of strategic importance to India's security. A substantial part of India's external trade and energy supplies pass through this region. The security of India's island territories, in particular, the Andaman and Nicobar Islands, remains an important priority. Drug trafficking, sea-piracy and other clandestine activities such as gun running are emerging as new challenges to security management in the Indian Ocean region.

FICCI believes that industry has the technological capability to implement border management solutions. The government could consider exploring integrated solutions provided by industry for strengthening coastal security of the country.

The FICCI-PwC report on 'Smart border management: Indian coastal and maritime security' highlights the initiatives being taken by the Central and state governments to strengthen coastal security measures in the country. The report also explores key challenges to coastal security and considers some of the international examples from countries like France, Japan, Russia, the UK and US, which could be relevant to designing coastal security strategies in India.

I sincerely hope that this report will offer important and useful insights to the government, enforcement agencies and all other stakeholders.



Dhiraj Mathur, IAS (Retd)
Partner and Leader, Aerospace
and Defence
PwC India



2 Preface

This report is a follow-up to our report ‘Smart border management: An Indian perspective’, which was released in September 2016. In our previous report, we had identified the challenges which India encounters owing to the varying border conditions, and introduced a framework to address those challenges. While we focused on land borders in the last edition, in this report, we examine the current state and challenges of coastal and maritime security in India and provide recommendations to further strengthen it through industry support.

With a 7,517-km long coastline, India sits centrally at the crossroads of trans-Indian Ocean routes. Most cargo ships that sail between East Asia, America, Europe and Africa pass through Indian territorial waters. This has contributed hugely to India’s growth and played a significant role in making India one of the fastest growing economies in the world. This statement may be further substantiated by the fact that around 95% of India’s trade by volume and 70% by value is done through maritime transport. However, India’s vast coastline and island territories also make it susceptible to attacks, infiltration for smuggling and terrorism, and other security threats.

In the wake of the 26/11 attacks in Mumbai in 2008, the government took several measures to strengthen coastal and maritime security along the entire coast as well as island territories. The ongoing Coastal Security Scheme (CSS) was augmented with plans to build more coastal police stations (CPSs) and surveillance infrastructure. Phase I of the scheme, with an estimated expenditure of 495 crore INR, was completed in 2011 and Phase II, with a budgeted outlay of 1,579 crore INR, is expected to be completed by 2020. The Government of India (GoI) launched a scheme for the issuance of biometric identity (ID) cards to coastal fishermen at a total cost of 72 crore INR. Eight coastal radars have been set up within the frameworks of the National Command Control Communication Intelligence (NC3I) programme to help counter potential infiltration from terrorists and pirates.

Due to the coordinated efforts of the Indian Navy, Indian Coast Guard (ICG), marine police and other Central and state agencies, the overall maritime security is much stronger than before. However, our experience and interactions with the industry suggest that many challenges in the domain are yet to be addressed. Foremost among these is the lack of integrated coordination between multiple stakeholders, resulting in limited focus from the Central and state governments towards the execution of coastal security measures. Unavailability of critical technology infrastructure like surveillance mechanisms to monitor coastal security across coastal states and union territories (UTs) leads to gaps in security that need to be filled at the earliest.

This report elucidates the present status of various programmes that have been undertaken by the government, both in central and coastal states. It highlights the efforts required for enhancing coastal and maritime security with support from industry, especially on the technology, infrastructure and capacity building fronts, and for building an integrated and collaborative coastal and maritime security management framework.

We trust that you will find this report useful and look forward to your valuable feedback.



3

Overview

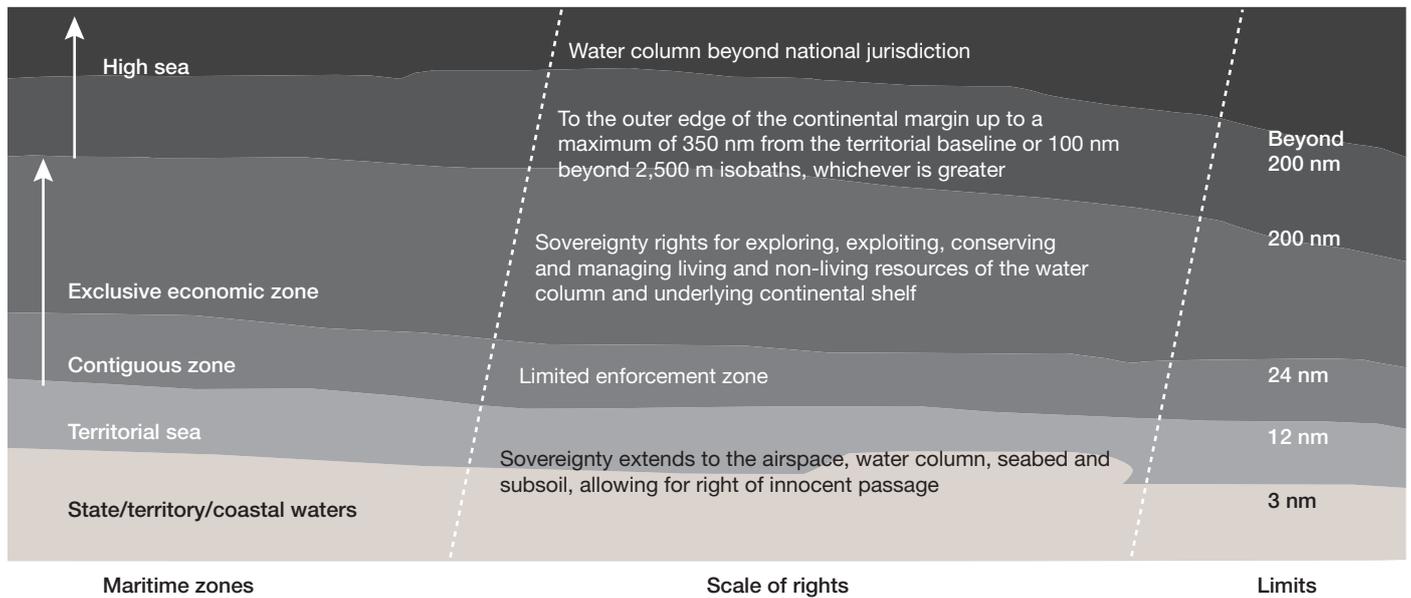
3.1. India's coastline and island territories

India has a coastline of 7,517 km, of which the mainland accounts for 5,422 km. The Lakshadweep coast extends for 132 km and the Andaman and Nicobar Islands have a coastline of 1,962 km. The Indian coastline is distributed among nine coastal states and four UTs, and almost the entire coast of India falls within the tropics. The nine coastal states are Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha and West Bengal. India also has large coastal wetlands, which cover an area of over 41,401 km², which is 27.13% of the total area covered by wetlands in India. India's inland wetlands, on the other hand, cover 1,05,649 km².

Most cargo ships that sail between East Asia, America, Europe and Africa pass through Indian territorial waters. According to the Ministry of Shipping (MoS), around 95% of India's trade by volume and 70% by value is done through maritime transport. Special economic zones (SEZs) are being developed in close proximity to several ports, thereby providing a logistical advantage to industries within these zones. The government has announced plans to develop 14 coastal economic zones (CEZs) in a phased manner for port-led development in all of the nine maritime states.

According to the Maritime Zone Act, 1976, the maritime zones of India are divided into five Coast Guard regions, with the Indian Coast Guard (ICG) responsible for the enforcement of maritime zones. The five regions are North-West, West, East, North-East and Andaman and Nicobar, with the respective regional headquarters located at Gandhinagar, Mumbai, Chennai, Kolkata and Port Blair. The regions are further divided into twelve Coast Guard 'districts', one each for the nine coastal states on the mainland, two in the Andaman and Nicobar region and one at Kavaratti in the Lakshadweep and Minicoy Islands. In addition, there are Coast Guard Air Stations (CGASs) and Coast Guard Air Enclaves (CGAEs) for air operations from various locations along the coastline. There are presently 12 major ports and 200 notified minor and intermediate ports in India. The 200 non-major ports are in the following states: Maharashtra (48), Gujarat (42), Tamil Nadu (15), Karnataka (10), Kerala (17), Andhra Pradesh (12), Odisha (13), Goa (5), West Bengal (1), Daman and Diu (2), Lakshadweep (10), Pondicherry (2), and Andaman and Nicobar (23). Apart from five main fishing harbours—Mangalore (Karnataka), Kochi (Kerala), Chennai (Tamil Nadu), Vishakhapatnam (Andhra Pradesh) and Raichak in Kolkata (West Bengal). Further, 23 minor fishing harbours

Maritime zones defined by the United Nations Convention on the Law of the Sea (UNCLOS)



and 95 fish-landing centres are designated to provide landing and berthing facilities to fishing craft.

The coastal areas are safeguarded by the police forces of the respective coastal states and UTs, which have jurisdiction of up to 12 nautical miles (nm) from the coast. India, a traditionally

maritime country with a rich maritime heritage, has an exclusive economic zone (EEZ) of 200 nm from its coast. India is currently seeking to extend its EEZ to 350 miles. The ICG and the Indian Navy have jurisdiction over the entire maritime zone up to 200 nm, including the 12 nm of territorial waters.

Major seaports across the Indian coast



Andaman and Nicobar Islands

The Andaman and Nicobar Islands are a group of 349 islands located at the juncture of the Bay of Bengal and Andaman Sea. Their territory is 150 km north of Aceh, Indonesia, and is separated from Thailand and Myanmar by the Andaman Sea. They comprise two island groups, the Andaman Islands and the Nicobar Islands, separated by the 10°N parallel, with the Andamans to the north of this latitude and the Nicobars to the south. The islands host the Andaman and Nicobar Command, the only tri-service geographical command of the Indian Armed Forces, which is of immense strategic significance for India. The geographical configuration and the location of the island chain in the Bay of Bengal safeguards India's eastern seaboard as well the approaches to the Indian Ocean from the east.

Lakshadweep

Lakshadweep is a group of islands in the Laccadive Sea, 200 to 440 km off the southwestern coast of India. The islands form the smallest UT of India, with a total surface area of just 32 sq. km and are served by an airport on Agatti Island. Of the 36 islands, only 11 islands are inhabited, out of which nine islands (Androth, Amini, Agatti, Chetlat, Kadmat, Kalpeni, Kavaratti, Kiltan and Minicoy) are significantly populated and two others (Bitra and Bangaram) have small or floating populations. Even though the land area is small, the islands are surrounded by lagoons measuring 4,200 sq. km and territorial waters measuring about 20,000 sq. km. Further, they have access to 4 lakh sq. km of EEZs. These ecologically fragile islands are strategically important for India and have abundant potential for the development of the fisheries, agriculture (coconut and coir) and tourism sectors.

3.2. Security threats and border disputes

3.2.1. Infiltration

India's long coastline pose a variety of security concerns:

- Landing of arms and explosives at isolated spots on the coast
- Infiltration/ex-filtration of anti-national elements
- Use of the sea and offshore islands for criminal activities
- Smuggling of consumer and intermediate goods through sea routes, etc.

3.2.2. Border disputes

New Moore

The island was uninhabited and there were no permanent settlements or stations located on it. Both India and Bangladesh had laid sovereignty claims over it because of speculation over the existence of oil and natural gas in the region. The issue of sovereignty was also part of the larger dispute over the Radcliffe Award methodology of settling the maritime boundary between the two nations. The matter was resolved in 2014, when the Permanent Court of Arbitration (PCA) delivered a verdict in the 'Bay of Bengal maritime boundary arbitration between Bangladesh and India' case in favour of Bangladesh.

Gulf of Kutch

The Great Rann of Kutch is a seasonal salt marsh located in the Thar Desert in the Kutch District of Gujarat, India, and the Sindh province of Pakistan. Sir Creek is a 96-km tidal estuary on the border of India and Pakistan. The dispute lies in the interpretation of the maritime boundary line between Pakistan and India. In India, the northern boundary of the Greater Rann of Kutch forms the international border between India and Pakistan. A verdict was reached in 1968, wherein Pakistan was awarded 10% of its claim of 9,100 sq. km and India, 90%. Since 1969, there have been 12 rounds of talks between the two nations; however, there has been no breakthrough, with the 12th round held in June 2012. Since neither side has conceded ground, India proposed that the maritime boundary could first be demarcated, as per the provisions of the Technical Aspects of Law of Sea (TALOS). However, Pakistan staunchly refused the proposal, claiming that the dispute should be resolved first. Pakistan also proposed that the two sides go in for international arbitration, which India has not agreed upon since it maintains that all bilateral disputes should be resolved without the intervention of third parties.

Palk Strait

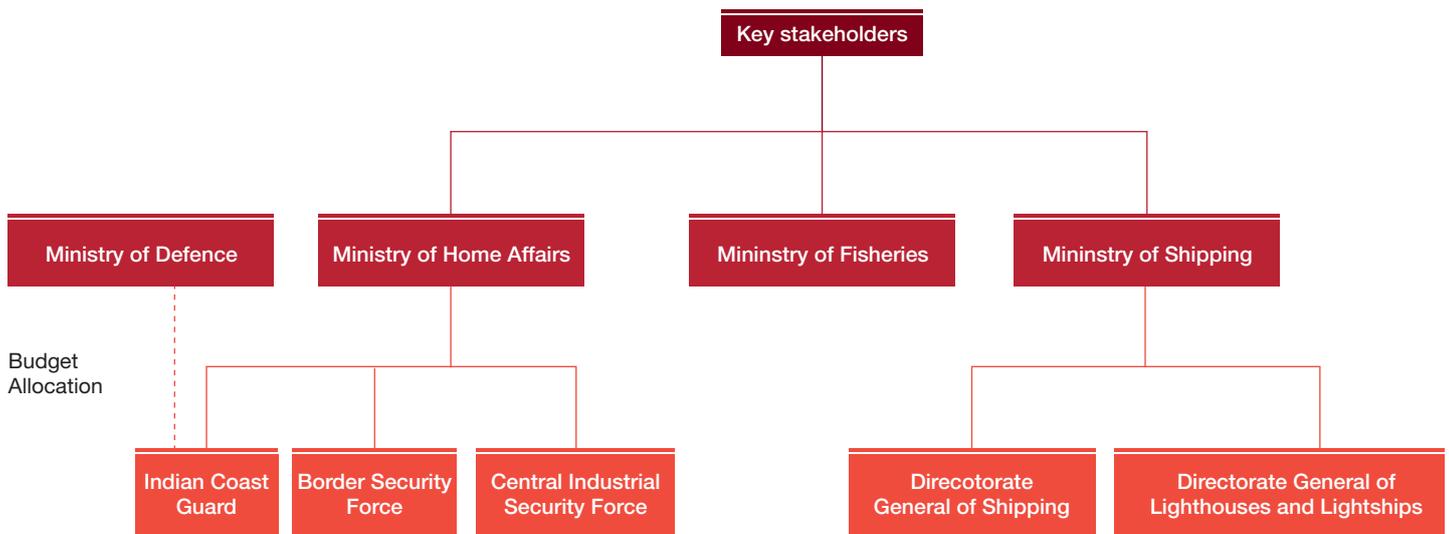
Known as the Palk Strait, the narrow strip of ocean between India and Sri Lanka has been a crucial factor in determining relations between the two countries. Inevitably, the long-standing dispute over fishermen in the Palk Strait has created administrative, logistical and security problems for both India and Sri Lanka. Further, Sri Lanka has long expressed concerns about illegal fishing by Indian fishermen within its territorial waters across the Palk Strait. Palk Strait separates the northern coast of Sri Lanka from the southeast coast of India. There have been continuous talks between the two nations to propose a possible mechanism to help find a permanent solution to the fishermen issues. Both sides agreed to release fishermen their custody—a regular practice meant to establish goodwill—thus encouraging progress on the long-standing dispute.

Sundarbans

The Sundarbans are part of the world's largest delta, formed by the rivers Ganges, Padma, Brahmaputra and Meghna and spread across West Bengal and Bangladesh. The whole tract of forest reaches inland for about 100–130 km from the confluence of these rivers in India and is located in the South 24 Parganas district of West Bengal. It covers an area of 4,262 sq. km, including a mangrove cover of 2,125 sq. km in India alone. In order to find a solution to the complex nature of this border demarcation, the Land Boundary Agreement (LBA) was signed in 1974; however, India did not ratify the agreement as it involved seceding territory. The dispute was finally settled in 2011 with the signing of Protocol 11 of LBA, 1974, when India agreed to give away to Bangladesh 110 of the 111 enclaves and receive 51 enclaves from Bangladesh in return. Due to its economically sensitive and trade-intensive nature, the Sundarbans region poses a particular challenge to the authorities to balance the protection of Indian interests and the security of international shipping interests while

preventing illicit activities. In 2015, it was proposed to identify the entire mangrove as a transboundary protected area (TBPA) and share information about its management to maximise benefits for both sides. A TBPA, also known as a trans-frontier conservation area or peace park, is a protected area that spans boundaries of more than one country or sub-national entity, where the political border sections that are enclosed within its area are abolished. This includes the removal of all human-made physical boundaries such as fences, allowing free migration of animals and humans within the area.

3.3. Stakeholders



Other key stakeholders involved in the paradigm of coastal security are:

- Indian Navy
- Ministry of External Affairs
- Ministry of Communication and Information Technology
- Border State Governments and Island Territories of India
 - State Marine Police
 - State Marine Home Guards (e.g. Tamil Nadu)
 - State Border Organisation (e.g. Assam Police Border Organisation)
 - State Coastal Security Committees
 - District Coastal Security Committees
- Intelligence agencies
 - National Technical Research Organisation
 - Research and Analysis Wing
 - Intelligence Bureau
 - Narcotics Control Bureau
 - Directorate of Revenue Intelligence
 - Defence Intelligence Agency
 - Directorate of Navy Intelligence

- Research and development
 - Indian Space Research Organisation (ISRO)
 - Defence Research & Development Organisation (DRDO)
 - National Centre of Excellence in Technology for Internal Security (NCETIS), IIT Bombay
- Land Ports Authority of India (LPAD), Ministry of Home Affairs
- Central Board of Excise & Customs, Ministry of Finance
- National Committee for Strengthening Maritime and Coastal Security (NCSMCS)
- National Marine Police Training Institute (MPTI) (to be created)
- Central Marine Police Force (to be created)

3.3.1. Ministry of Home Affairs

The Ministry of Home Affairs (MHA) is mainly responsible for the maintenance of India's internal security and domestic policy. It extends manpower and financial support, guidance and expertise to the state governments for the maintenance of security, peace and harmony without trampling upon the

constitutional rights of the states. The MHA has the following constituent departments which take care of internal security related aspects:

- Department of Border Management
- Department of Internal Security
- Department of Jammu and Kashmir Affairs
- Department of Home

The Department of Border Management was created in January 2004 to focus on the issues relating to the management of international land and coastal borders, strengthening of border policing and guarding, creation of infrastructure such as roads, fencing and flood lighting on the borders, and implementation of the Border Area Development Programme. The functions/responsibilities of the department for coastal regions include, inter alia, the following:

- All matters relating to coastal border, including the island territories of Andaman and Nicobar and Lakshadweep, etc.
- Strengthening of border policing, surveillance and patrolling of all land and coastal borders
- Creation of infrastructure along the coastal belt
- Implementation of Coastal Security Schemes (CSS)

The MHA is implementing supplementary CSS to strengthen the marine police of nine coastal states and four UTs to enhance surveillance and close water patrolling in the coastal areas.

3.3.1.1. Indian Coast Guard

The ICG is a multi-mission organisation that is responsible for coastal security in territorial waters, including areas to be patrolled by the coastal police. It is also responsible for maintaining maritime surveillance across India's two million sq. km EEZ, and contributes towards the development and implementation of an effective security mechanism to combat seaborne threats. The security matrix of the ICG encompasses a host of operations and involves measures undertaken to address coastal security, offshore security, anti-terrorism, anti-piracy and port security. The ICG also provides support to the Indian Navy to ensure the maritime security of the country.

After the terror attacks in Mumbai in 2008, there has been a paradigm shift in the maritime security apparatus. Currently, there is an increased emphasis on surveillance, intelligence gathering and information sharing amongst the various stakeholders to ensure an effective response to any emerging situation. In February 2009, the ICG was additionally designated as the authority responsible for coastal security in territorial waters, including areas to be patrolled by the coastal police. The ICG is also responsible for overall coordination between the Central and state agencies in matters relating to coastal security. As part of coastal security mechanisms, a surveillance system called the Coastal Surveillance Network (CSN), comprising a chain of static sensors having radars, an automatic identification system (AIS), day/night cameras and metrological sensors has been established at 46 locations along the coastline and island territories by the ICG. In order to achieve near gap-free surveillance of the entire coastline, 38 additional radar stations and eight mobile surveillance systems, apart from

vessel traffic management system (VTMS) connectivity at the Gulf of Kutch and Gulf of Khambhat, are being installed under CSN Phase-II.

The ICG has also promulgated standard operating procedures (SOPs) for ensuring coordination and cohesion amongst various agencies involved in coastal security. The ICG and marine police are working according to the 'hub-and-spoke' concept; the hub being the ICG stations and the spoke being the CPSs. To revalidate the coastal security mechanism and create awareness among the fishermen at sea, regular boarding operations are also being conducted to validate and check the credentials of the occupants of the vessels, including their identity cards and registration documents. Further,



based on intelligence inputs, coastal security operations are conducted by the ICG in coordination with other stakeholders.

Community interaction programmes (CIPs) are conducted periodically by the ICG for the fishermen and coastal populace in order to sensitise them to security and safety issues. In order to develop their capacity, the ICG has been imparting regular training to marine police personnel since 2006. Regular training programmes are conducted at the Coast Guard District Headquarters corresponding to the coastal states/UTs.

In order to strengthen the capabilities of the ICG with regard to anti-smuggling and narcotics control, the Government of

India (GoI) has sanctioned the merger of the Customs Marine Organisation (CMO) under the Department of Revenue with the ICG.

In West Bengal earlier this year, the ICG commissioned a 27-m long high-speed interceptor boat C-424, which can reach a speed of 45 knots, for the further development of West Bengal's coastal security measures. Along with this new boat, West Bengal now has Coast Guard assets, including three fast patrol vessels, four hovercrafts, two interceptor boats, a radar station and an air cushion vessel (ACV) forward-operating base in Frazerganj.



In Andhra Pradesh, the ICG conducted 110 outreach programmes with the fishing community to sensitise them to the local government's coastal security undertakings. The fishermen were educated on search and rescue operations, precautionary measures during harsh weather, distress alarms and proper documentation requirements. The programme was a product of the policies that the state is trying to develop for better communication and cooperation between the coastal security officials in Andhra Pradesh and the fishing/trading community.

Keeping the 26/11 attacks in mind, the government has approved a 31,748 crore INR 'definitive five-year action

programme' for the Coast Guard. The aim is to make the Coast Guard a 175-ship and 110-aircraft force by 2022 to plug the operational gaps and strengthen its capabilities to safeguard coastal security, island territories, offshore assets and the marine environment, as well as undertake anti-piracy, anti-smuggling, oil-spill and pollution-control operations. The Coast Guard currently operates 130 ships consisting of 60 offshore patrol vessels, fast-patrol vessels and pollution-control vessels, 18 hovercrafts, and 52 smaller interceptor boats/crafts. The air assets consist of 39 Dornier maritime surveillance aircraft, 19 Chetak choppers and four Dhruv advanced light helicopters (ALHs). For future requirements, the Coast Guard has 65 ships and interceptor crafts/boats under construction and has planned the acquisition of 30 helicopters. Further, 16 indigenous Dhruv choppers have already been ordered from Hindustan Aeronautics Ltd, and the procurement of 14 twin-engine EC-725 tactical choppers from Airbus is in the final stages of approval. The force is also looking for six more maritime multi-mission surveillance aircraft and the establishment of five air stations/enclaves.

3.3.1.2. Border Security Force

Established in 1965, the Border Security Force (BSF) is a paramilitary force responsible for guarding India's land borders during peace time and preventing transnational crime. The BSF falls under the administrative control of the MHA. In order to thwart the landing of terrorists through sea routes, the BSF formed its first commando unit called Creek Crocodiles. The Creek Crocodile Commando unit is an elite commando force with 42 commandos responsible for manning 85 km of hostile creek area where India shares a border with Pakistan along the Rann of Kutch. The coastline is abundant with creeks that could be used by infiltrators to evade security forces and radars. As a result, the circumstances mandate difficult defensive requirements, especially during high tides and tough weather. Further, the lands are entirely submerged and poisonous snakes and scorpions are rampant. The BSF primarily patrols the three largest creeks in the region—namely Sir Creek, Kori Creek and Padala Creek. The Creek Crocodile Commandos are equipped with around six all-terrain vehicles (ATVs) and 30 fast patrol boats, including four American-made fast attack craft (FAC).

3.3.1.3. Central Industrial Security Force

The Central Industrial Security Force (CISF) provides security cover to nuclear installations, space establishments, airports, seaports, power plants, sensitive government buildings and heritage monuments along the coastline. The CISF is an integral part of the coastal security apparatus and hence participates in various coastal security exercises organised by the ICG in India's coastal states.

3.3.2. Ministry of Shipping

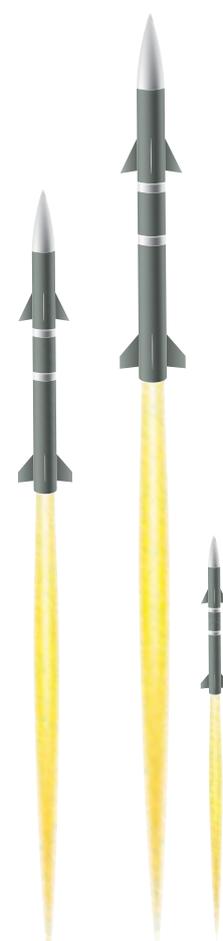
The MoS, through the Director General of Shipping and along with the Directorate General of Lighthouses and Lightships (DGLL), has implemented measures to enhance maritime domain awareness along India's coastline. The national AIS and vessel traffic service (VTS), which have been initiated, have contributed towards enhancing the coastal security apparatus.

3.3.2.1. Ministry of Fisheries

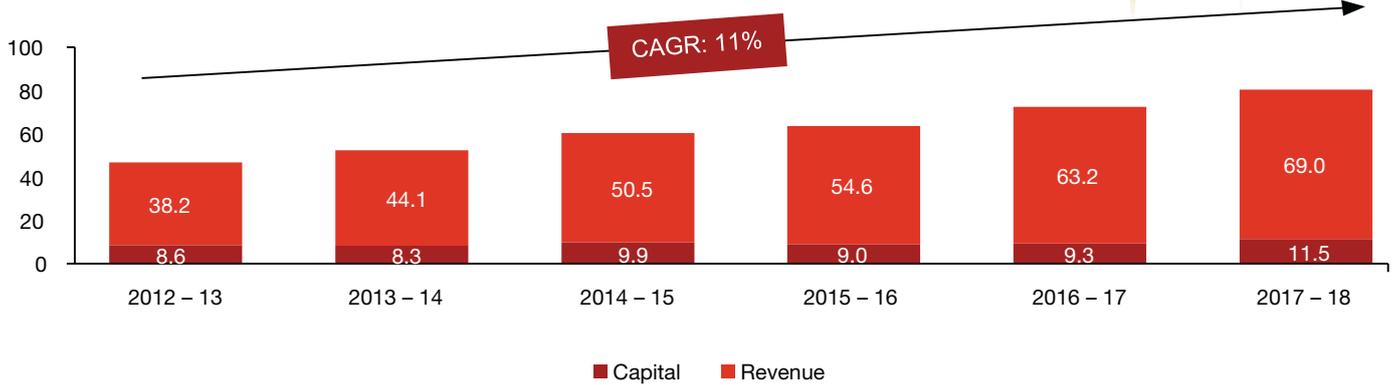
The scheme for the issuance of biometric identity (ID) cards to coastal fishermen at a total cost of 72.0 crore INR was launched by the Ministry of Fisheries on 11 December 2009. A consortium of three Central public sector undertakings (CPSUs), led by Bharat Electronics Ltd (BEL) along with state governments/UTs, has been entrusted with the work of digitisation of data and card production and issuance.

3.4. Budget analysis

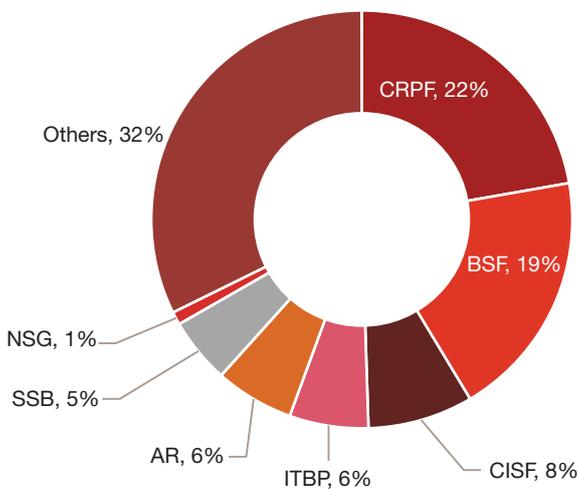
Beginning with the spike in budgetary allocation to the MHA in 2009–10 following the Mumbai terror attacks of November 2008, the budget has steadily increased over the years. In the last three years too, allocations have gone up from 60,393 crore INR in 2014–15 to 63,581 crore INR in 2015–16 and 72,527 crore INR in 2016–17. This upward trend has continued during the current year with allocations reaching 80,476 crore INR, a hike of around 11.5% in comparison to the previous year.



Homeland security budget allocation (thousand crore INR)



Allocation of the 2017–18 budget (%)



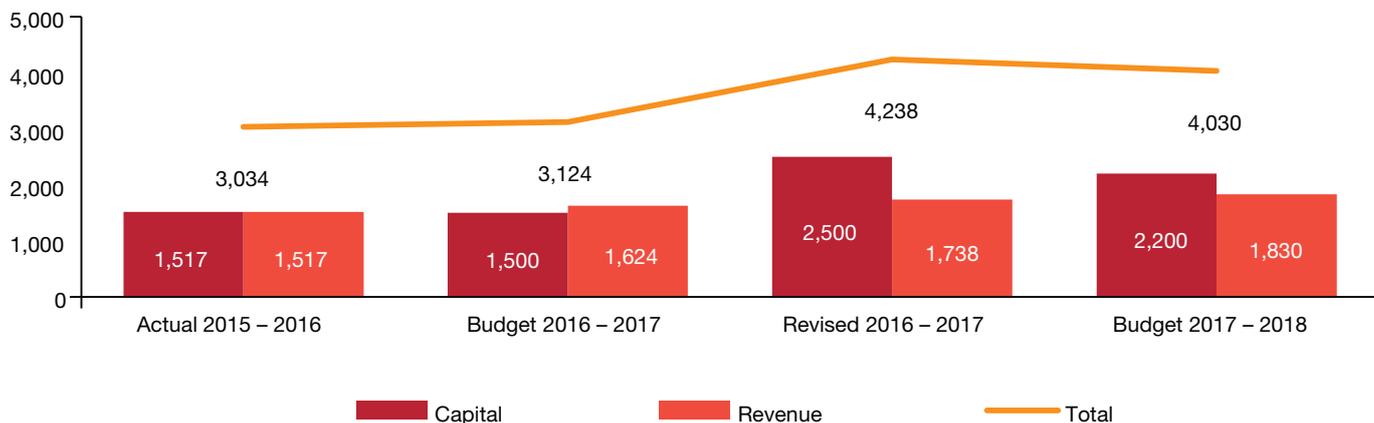
AR: Assam Rifles, BSF: Border Security Force, CISF: Central Industrial Security Force, CRPF: Central Reserve Police Force, ITBP: Indo-Tibetan Border Police, NSG: National Security Guard, SSB: Sashastra Seema Bal.

The category 'Others' includes disaster management, Home Guards, Civil Defence, Intelligence Bureau (IB), Central Police Organisations, Special Protection Group (SPG), National Intelligence Grid (NATGRID), Narcotics Control Bureau (NCB), Border Infrastructure and Management.

Source: Controller General of Defence Accounts

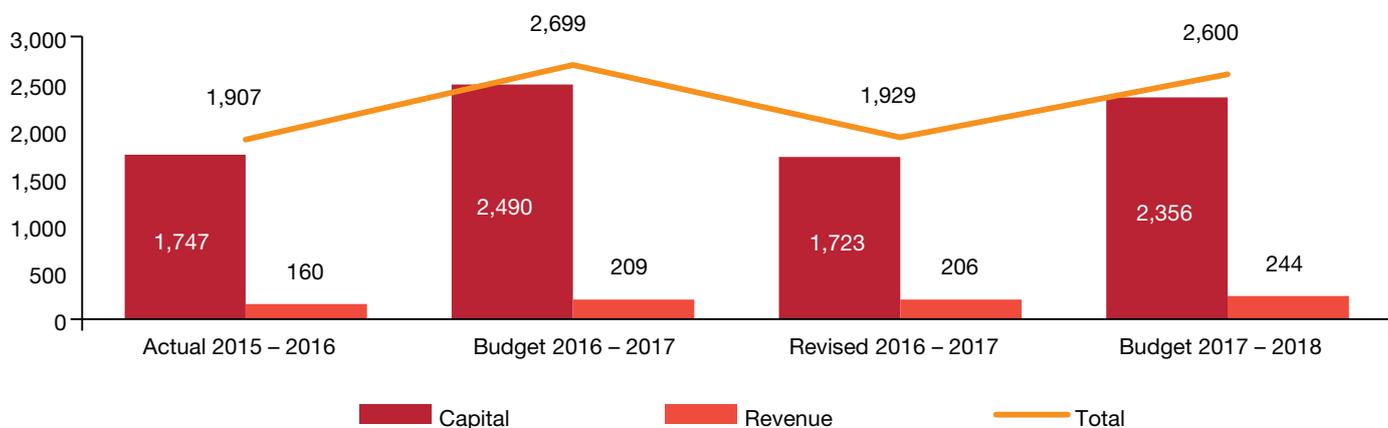
The ICG receives its budget allocation out of the Ministry of Defence's (MoD's) budget. For the financial year 2017–18, the ICG was allocated a total budget of 4,030 crore INR, which was a growth of 29% over last year's budget of 3,124 crore INR.

ICG budget allocation (thousand crore INR)



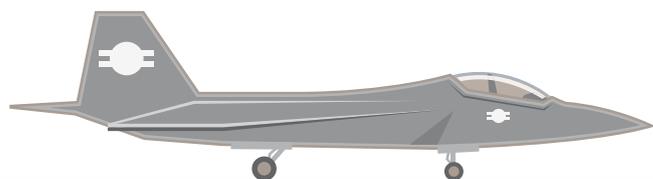
Source: Union Budget 2017

Budget allocation for Budget Infrastructure and Management (thousand crore INR)



Source: Union Budget 2017

For the financial year 2017–18, Border Infrastructure and Management was allocated a capital budget of 2,355.68 crore INR, which was a decrease of 5% from last year's capital budget allocation of 2,490 crore INR. The provision is for the induction of hi-tech surveillance on the Indo-Bangladesh and Indo-Pak Borders, erection of barbed wire fencing, and installation of flood lightning for setting up of mobile check posts in coastal areas of the country for better surveillance and to check on illegal activities, etc.





4

Current initiatives

4.1. Central government

4.1.1. Coastal Security Scheme

In order to strengthen coastal security measures in the country, a CSS was launched in 2005 across all nine coastal states and four coastal UTs. The main objective of the scheme was to strengthen infrastructure of the marine police force in order to improve patrolling and surveillance of the coastal areas, especially the shallow areas close to the coast. The CSS was to be implemented in two phases, with Phase I to be launched in 2005 for a period of five years, which was later delayed by one year and ended up being completed in 2011. Phase II was then implemented in 2011 for five years, which was again extended due to delays in implementation and is now likely to be completed by 31 March 2020.

Phase I

The total outlay for the scheme was estimated to be 495 crore INR for non-recurring expenditure and 151 crore INR for recurring expenditure for six years on fuel, repair and maintenance of boats and training of personnel by the states and UTs, with an additional non-recurring outlay of 95 crore INR by the Central government in 2010. The government provided assistance to all the coastal states and UTs to set up 73 CPS, 97 check posts, 58 outposts and 30 operational barracks. They were also equipped with 204 boats, 153 jeeps and 312 motorcycles. In addition, monetary assistance of 10 lakh INR was given per police station for the purchase of equipment, furniture and computers. Phase I was extended by one year and was completed in March 2011.

Phase II

Phase II of this scheme was made operational from 2011 to further strengthen marine police infrastructure with the establishment of more CPSs and purchase of additional boats, vehicles and jetties. This scheme was approved for implementation over a five-year period starting April 2011. The approved financial outlay for the scheme was 1,579 crore INR for the provision of 131 CPSs, 60 jetties, 131 four-wheelers and 242 two-wheelers. Lump sum assistance of 15 lakh INR per CPS was also provided for the purchase of surveillance equipment, furniture and computer systems. By September 2016, of the 131 sanctioned CPSs, 109 had been operationalised and 85 constructed. Also, 127 four-wheelers and 234 two-wheelers had also been procured. For the jetties, 58 sites out of the sanctioned 60 jetties had been identified and 22 jetties have been made operational.

After the completion of the two phases of the CSS, its status in February 2017 is as follows:

Sr. no.	Name of state/UT	CPSs	Boats/vessels	Four-wheelers	Two-wheelers	Jetties	Check posts	Outposts	Barracks
									
1	Gujarat	22	30	32	125	-	25	46	-
2	Maharashtra	19	28	32	71	14	32	-	24
3	Goa	7	9	6	9	-	-	-	-
4	Karnataka	9	15	13	12	-	-	-	-
5	Kerala	8	24	26	44	-	-	-	-
6	Tamil Nadu	32	24	42	96	-	40	12	-
7	Andhra Pradesh	21	18	27	48	-	-	-	-
8	Odisha	18	15	23	41	-	-	-	-
9	West Bengal	14	18	20	28	-	-	-	6
10	Daman and Diu	2	4	5	9	2	-	-	-
11	Puducherry	4	3	5	9	1	-	-	-
12	Lakshadweep	7	6	11	14	-	-	-	-
13	Andaman and Nicobar Islands	20	10	38	40	6	-	-	-
	Total	183	204	280	546	23	97	58	30
	Sanctioned	204	429	284	554	60	97	58	30
	Remaining	81	225	4	8	37	-	-	-

CSS status across states

Gujarat

Under the CSS initiated by the GoI, out of the total 73 proposed marine police stations (all maritime states), 9 are operational at Gujarat Maritime Board (GMB) ports—namely Porbandar, Pipavav, Somnath, Bhavnagar, Hazira, Jakhau, Mundra, Vadinar and Okha. The Government of Gujarat has also allotted land for developing marine police stations. The Gujarat marine police is the local amphibious force that operates within 12 nm off the state coast. It was set up in late 2006 under Phase I of the CSS and is regulated by superintendents through coastal checkpoints (CCPs), CPSs and coastal outposts (COPs). Their major responsibility is to safeguard immediate coastal bodies and to prevent terrorist infiltration along the coastline. The coastal police operates 22 CPSs and has a 350-strong force of navy-trained commandos. In 2014, however, the state added 1,000 commandos.

West Bengal

Under the CSS, the government approved several provisions for West Bengal to develop and acquire coastal infrastructure. Under Phase I of the scheme, West Bengal was granted permission to build six CPSs and acquire 18 interceptor boats, 12 jeeps and 12 motorcycles. Under Phase II of the scheme, the government approved the development of an additional eight CPSs in West Bengal, procurement and delivery of seven 12-tonne interceptor boats, and construction of four jetties. With this assistance, as of February 2017, West Bengal has 14 CPSs, 18 boats/vessels, 20 four-wheelers, 28 two-wheelers and six barracks.

Maharashtra

Under the CSS, the government sanctioned 4092.60 lakh INR to Maharashtra to build 12 police stations and 32 check posts and procure 28 boats, 25 jeeps and 57 motorcycles. Additionally, the Maharashtra government has announced the sanction of 49 crore INR for acquiring speedboats, immediate hiring of patrol boats and forming a state-of-the-art cyber monitoring unit for intelligence gathering. Until now, the Maharashtra has 19 CPSs and 32 sanctioned check posts.

Tamil Nadu

The Coastal Security Group (CSG) is in the process of procuring unmanned robotic boats to monitor intruders and terrorists remotely. The boats will be fitted with manoeuvrable HD cameras with infrared capabilities. With the help of a network of sensors, the boats will transmit messages and images of suspicious activities along Tamil Nadu's coasts.

Andhra Pradesh

The Andhra Pradesh Coastal Security Police (CSP) has also been undergoing upgradation. After the implementation of Phase II of the CSS, the state has built 21 police stations and acquired 18 boats, 27 four-wheelers and 48 two-wheelers. Under the same scheme, 32 more marine boats, at the cost of 60 crore INR, were also sanctioned for the CSP fleet. Garden Reach Shipbuilding and Engineers Ltd, Kolkata, is in charge of delivering these crafts to the Andhra Pradesh CSP.

Goa

There are seven CPSs in Goa, four of which are in the north and three in the south.

Kerala

The coastal police has taken several initiatives to improve its ability to patrol, including submitting proposals for the construction of coastal police headquarters, a coastal police battalion and acquiring ATVs for 18 CPSs.

4.1.2. International Ship and Port Facility Security Code

The International Ship and Port Facility Security (ISPS) Code is a comprehensive set of guidelines and regulations established for the security of ships and port facilities. Developed by the International Maritime Organisation (IMO) in response to the 9/11 attacks, the code is constituted in the International Convention for the Safety of Life at Sea (SOLAS), an international maritime treaty. All 148 signatories of the treaty, including India, are required to comply with the ISPS Code. The purpose of the set of regulations is to establish a standardised framework across international ports and ships, which then allows governments to efficiently evaluate risks and offset threats and vulnerabilities to shipping and port facilities through alterations to security levels and undertaking the security measures prescribed by the Code. Compliance with the ISPS Code falls within the spectrum of central programmes related to maritime security. The standardised regulations aim to:

- Monitor the access of unauthorised persons on port premises.
- Track cargo operations and detect security threats on vessels or on shore.
- Assign appropriate security levels to ships and establish various duties and functions within each security level.
- Prescribe roles and responsibilities for port state officers and on-board officers to manage maritime security threats at an international level.
- Gather global data related to maritime security threats and results to tackle the same.

There are three security levels for ports within the ISPS Code, and each level consists of certain security undertakings that are mandatory for proper compliance.

- 1. Security level 1 (normal):** The ship or port facility operates normally. It mandates a set number of security measures to be active within the ports, which include compulsory pre-boarding checks, constant surveillance of 'no access' zones and coordinated supervision of cargo and minimum access to ships.
- 2. Security level 2 (heightened):** Level 2 stays active for as long as there is a substantial amount of risk present against the port/ship facility. It requires additional layers of security, over and above the minimum requirements, until the threat is mitigated. Security measures require deployment of additional personnel, limiting waterside access to the ship, establishing restricted areas, escorting visitors on board and conducting comprehensive searches on ships.
- 3. Security level 3 (exceptional):** Level 3 implies probable and imminent risk and requires maximum security for a limited time frame. Even if the specific target is unidentified, ports are expected to be ready to evacuate ships, limit access to a single point, suspend movement of any shipping traffic, suspend cargo and storage operations, and closely monitor personnel and vessels in the port facility.

Implementation in India

The ISPS Code was made mandatory in India starting 1 July 2004, with its implementation handled by the Company Security Officer (CSO), under the Shipping Corporation of India (SCI). Furthermore, the CSO is in charge of monitoring internal and external audits, equipping personnel with relevant training and coordinating with shipping companies and crew to maintain consistent safety measures.

Current status

- All 12 major ports are officially ISPS-compliant, whereas 10 of the 64 minor ports that handle export-import (EXIM) cargo have not been certified as compliant.
- As on November 2016, out of the 227 minor ports, 112 had minimal security cover and 75 had no security cover at all.

- In 2011, the Centre approved the deployment of radiological detection equipment (RDE) at the 16 major ports; however, the Port Blair Port Trust and Cochin Shipyard are yet to receive the equipment.

State-level implementation

Gujarat

- For compliance with the ISPS Code, various measures have been taken to improve maritime security and safety with the help of technology and IT.
- Long-term goals have been determined for the security of coastlines and ports, including the patrolling of boats for coastal security and the use of metal detectors, radars, illumination facilities, CCTVs/cameras.
- GMB ports where foreign cargo is being handled are provided with safety arrangements under the ISPS Code and regular patrolling is being carried out at sea and along coastal areas at important ports, such as Bedi, Porbandar and Okha, through high-speed patrol boats that are engaged on a contract basis.

4.1.3. National Automatic Identification System

The DGLL established the national AIS network by setting up 74 shore stations on existing lighthouses along the Indian coast for facilitating aid to marine navigation and tracking of SOLAS vessels. The AIS network plans to track all SOLAS-compatible vessels and also those carrying transponders as per the Directorate General of Shipping's notices. This will provide an overall image of AIS-compliant vessels along the Indian coastline. Thus, apart from management, the AIS network will aid navigation and creation of maritime domain awareness along the coastline. The national AIS network comprises the following:

- 74 Physical Shore Stations (PSSs) installed at various lighthouses on the Indian coast
- 6 Regional Control Centres (RCCs) located at regional headquarters, i.e. Jamnagar, Mumbai, Kochi, Chennai, Kolkata, and Dolphin's Nose Lighthouse, Vishakhapatnam
- 2 Coastal Control Centres (CCCs) located at Deep Bhavan, Mumbai, and Dolphin's Nose Lighthouse, Vishakhapatnam
- National Data Centre (NDC) located at Deep Bhavan, Mumbai
- Simulator located at Dolphin's Nose Lighthouse, Vishakhapatnam
- Viewing terminals for the Indian Navy at the Directorate of Net Centric Operations (DNCO), New Delhi, along with Joint Operations Centres (JOCs) at Mumbai and Vishakhapatnam
- Viewing terminal for the ICG located at Coast Guard Headquarters (CGHQ), New Delhi
- Viewing terminal for the Directorate General of Shipping located at the Long Range Identification and Tracking (LRIT) Data Centre, Jahaz Bhavan, Mumbai

4.1.4. Biometric ID cards for coastal fishermen

The Centre's sector scheme on the issuance of biometric ID cards to coastal fishermen at a total cost of 72 crore INR was launched by the Ministry of Fisheries on 11 December 2009. The Central government has provided a 100% grant to the state governments, UT administrations and other implementing agencies for the scheme. A consortium of three CPSUs, led by BEL along with state governments and UTs, have been entrusted with the work of the digitisation of data and card production and issuance. The scheme is being operated with the following components:

- Assistance to coastal states/UTs for data collection and authentication
- Personalisation and production of biometric ID cards
- Key management system
- Establishment of central servers
- Continuation of support to the project

The basic objectives of the scheme are:

- To empower every Indian coastal fisherman through the issuance of application-oriented biometric ID cards
- To establish a National Marine Fishers Database (NMFD) which can be accessed by all authorised agencies, both at the Central and state/UT levels
- To strengthen coastal security and reduce threats from sea routes
- Issuance of national biometric ID cards/Marine Fishers Identity Cards (MFIDs) to eliminate duplication of cards presently issued to fishermen by different agencies/states
 - Maharashtra: More than 72,000 cards have been distributed
 - Andhra Pradesh: 13,000 distributed, 7,000 more to be distributed

4.1.5. Vessel tracking management systems

Approved by the Defence Acquisition Council (DAC) under the MoD and deployed by the Indian Navy, eight coastal radars were set up within the frameworks of the National Command Control Communication Intelligence (NC3I) programme to help counter potential infiltration from terrorists and pirates.

- The radar stations in Gujarat integrate with 33 other coastal radar stations across the nation to create a complex network of marine tracking that is controlled by the Information Management and Analysis Centre (IMAC) in Gurgaon.
- The DAC also approved four mobile surveillance stations in Kutch and Khambhat, which will be equipped with the VTMS.
- Located at various locations such as Porbandar, Dwarka, Mangrol, Gopnath, Diu, Daman, Navadra and Hazira, the VTMS has the capacity to track 30,000 vessels along with ICG radars and all of the 43 ports in the state on the high-priority list.



State-level implementation

Gujarat

- The Government of Gujarat, Kandla Port Trust (KPT), and the GoI have already implemented the VTMS in the Gulf of Kutch from February 2012. VTMS in the Gulf of Khambhat has been operational on build, own operate and transfer (BOOT) basis since 15 August 2010. The ports in the Gulf of Khambhat are benefiting from enhanced security measures through the VTMS, such as protecting vessels carrying hazardous cargo, providing vessel traffic information and navigation advice, monitoring shipping lanes and separation schemes to enforce compliance of safe navigation regulations, assisting the Coast Guard and other authorities, detecting oil spills, and improving the overall efficiency of ports. The VTMS is expected to put the practices followed along the Gujarat coast in line with those followed internationally as the VTMS is prevalent in places like Europe and the Suez Gulf.

4.1.6. Coastal Surveillance Network

The CSN has been set up by the ICG to improve the coastal security mechanism in the country. This network comprises a chain of static sensors having radars, AIS, day/night cameras and met sensors at 46 locations along the coastline and islands. All of this was established under Phase I of the CSN, whereas under Phase II, in order to plug the gaps in the electronic surveillance coverage along the coastline, the MoD had approved an 800 crore INR project in February 2017 to install 38 additional radar stations and eight mobile surveillance systems, apart from VTMS connectivity, at the Gulf of Kutch and Gulf of Khambhat.

Vessel traffic service

The purpose of VTS is to improve the safety and efficiency of navigation, make life at sea safe, and protect the marine environment, worksites and offshore installations from possible adverse effects of maritime traffic. This objective is achieved by integrating a number of sensors like radar, direction finder (DF), GPS, directional GPS (DGPS), and hydrological and meteorological sensors, which provide an overall geographical picture of the area to enhance maritime domain awareness. The service has been established in the Gulf of Kutch and covers the entire area where X/S-band radars have been installed at Okha and Jakhau, along with X-band radars at Koteswari, Chhachhi, Navinal, Kandla, Balachadi and Chudeshwar.

4.1.7. Community interaction programme

The ICG has been taking several steps to educate fishermen communities in the coastal areas of the country to help them ward off threats from the sea as they serve as the first line formation in India's coastal security architecture. Coastal security awareness drives/campaigns are conducted by the Indian Navy and ICG in all coastal districts of the country in order to better prepare the fishermen and coastal communities and to serve as the 'eyes and ears' of the Indian coastal security mechanism. Additionally, multiple CIPs have been

initiated to impart all necessary knowledge. The ICG has been holding regular training sessions since 2006, which consist of three weeks of orientation modules and one week of on-job training (OJT). Several other initiatives have been undertaken at the Central level to help coastal communities, including the issue of biometric ID cards to fishermen, colour coding of all boats leaving the docks and the registration of over 2 lakh fishing vessels.

4.1.8. Sagarmala

Sagarmala is a series of projects designed to leverage India's coastline and inland waterways to drive industrial development. The maritime sector in the country has faced several constraints in its development, mainly the lack of a cohesive institutional arrangement, weak infrastructure at ports and beyond, and limited economic benefit to the region and the community at large. The key objective of the Sagarmala series of projects is to develop port infrastructure in India to provide for quick, efficient and cost-effective transport to and from ports. It also includes the establishment of rail/road linkages with port terminals, which will result in last mile connectivity to ports, development of linkages with new regions and enhanced multi-modal connectivity, including rail, inland water, coastal and road services. The main aim of the project is to utilise the country's 7,517 km coastline, 14,500 km of potentially navigable waterways, and strategic locations on key international maritime trade routes.

Projects under Sagarmala

As part of Sagarmala, more than 400 projects, at an estimated infrastructure investment of more than 7 lakh crore INR have been identified across the areas of port modernisation and new port development, port connectivity enhancement, port-linked industrialisation and coastal community development.



equity support to residual projects under Sagarmala. The first board meeting of the SDC was held on 21 September 2016, during which a subscribed share capital of 90 crore INR was released to the SDC. The process is underway for the appointment of a managing director and other functional directors.

4.1.9. Operation Swan

In response to the 1993 Mumbai blasts, Operation Swan was launched in April 1993 as a joint operation of the Indian Navy and the ICG in conjunction with the respective state administration. The primary aim of this operation was to prevent the unauthorised and illegal entry of men and landing of arms, explosives and contraband along the coast of Gujarat and Maharashtra by sea. It also focused on obtaining intelligence about unusual movements or activities of personnel near the coastline having a bearing on security and to facilitate immediate actions to stall attempts at violating the sea frontiers for nefarious purposes.

- Under this plan, a three-tier system was established. Along the outermost layer beyond 200 nm, the Indian Navy was assigned the responsibility of patrolling the high seas and carrying out aerial reconnaissance using ship-based aircraft. The ICG was assigned the responsibility of patrolling the intermediate layer between 12 and 200 nm. For the innermost layer (within 12 nm), a joint coastal patrolling team comprising personnel from the Indian Navy, state police and customs was set up to increase surveillance using trawlers in shallow waters, creeks and inlets which were previously unmonitored.
- A core group consisting of representatives of the Indian Navy and ICG, as well as those from other state-run security organisations such as the police, customs, intelligence and home departments, was established for the effective execution of Operation Swan. This core group met at regular intervals to review and discuss various aspects regarding the operation. Coastal surveillance was coordinated through seven detachments set up in Maharashtra and 13 detachments set up in Gujarat. Administration and logistics support to these detachments was provided by Indian Naval Ship (INS) Angre, Mumbai, and INS Dwarka, Porbandar. For the purpose of ensuring layered surveillance, the assets were deployed in three distinct layers. An outer layer of 50 nm and beyond was kept under watch using the Indian Navy and ICG ships and aircraft. The intermediate layer between 25 to 50 nm was covered by smaller Indian Navy and ICG patrol boats and hired trawlers. The inner layer (up to 12 nm) was jointly patrolled by the Indian Navy, customs and police personnel using hired trawlers.

These projects will be implemented by relevant Central ministries, state governments, ports and other agencies, primarily through the private or public-private partnership (PPP) mode. Some of the key features of the Sagarmala programme are as follows:

- Modernise port infrastructure and identify six new port locations—namely Vadhavan, Enayam, Sagar Island, Paradip Outer Harbour, Sirkazhi and Belekeri. Each of these proposed new ports is set to be completed by May 2019.
- Improve port connectivity through rail corridors, freight-friendly expressways and inland waterways.
- Create 14 CEZs and one SEZ at the Jawaharlal Nehru Port Trust in Maharashtra. Develop the skills of fishermen and other coastal and island communities.
- A total of 242.92 crore INR has been released for 14 projects under Sagarmala till December 2016. In addition, the MoS is funding special projects under Sagarmala for which 58.5 crore INR has been released for capital dredging for the Gogha-Dahej RO-Pax Ferry Services Project, and 43.76 crore INR has been released for RORO Services Project at Mandwa.
- The Sagarmala National Perspective Plan was released on 14 April 2016 with details on project plan and implementation.
- The Union Budget 2017–2018 has allocated 600 crore INR for the Sagarmala Programme.

Sagarmala Development Company

The Sagarmala Development Company (SDC) was incorporated on 31 August 2016 after it was approved by the Cabinet on 20 July 2016. The company was formed to provide

4.2. State governments

4.2.1. Gujarat



In addition to its close proximity to Pakistan's borders and the presence of largescale fishing activities off the coast and trading hubs across the state, Gujarat has the longest coastline among all the states (1,600 km) in the country. Gujarat is strategically located and is the nearest maritime outlet to the Middle East, Africa and Europe. The state has 42 ports which include one major port and 41 non-major ports. It has the highest number of operational ports and commercial cargo ports, and ranks first in cargo amongst all Indian states. The responsibility of guarding the 1,600 km coast falls within a complex network of interdependent agencies within the jurisdiction of the state or the Centre. Ports in Gujarat handle 32% of the entire nation's cargo. Furthermore, security and trading entities have to tackle natural disasters like floods as Gujarat lies in the tropical cyclone region. The state remains one of the most critical regions in the maritime security framework of India.

4.2.1.1. Initiatives

- As the state handles 32% of the country's cargo, the GMB, which is the state's prime authority on ports, has the added responsibility of strict vigilance of its ports, besides having to undertake infrastructure development projects. The GMB has created the Gujarat Industrial Security Force Society (GIFS), which consists of 280 personnel who protect 9 of the 19 ports, whereas the remaining 10 are being guarded by the State Reserve Police.

- To track and monitor the movement of Indian fishermen, the Government of Gujarat has decided to establish a satellite-based tracking and warning system on about 12,000 fishing boats at a cost of 95 crore INR. Through this system, fishermen can be tracked and warned while crossing the international maritime boundaries and can also be given warning messages during any natural calamity, such as tsunamis and cyclones. Moreover, fisherman can send distress signals.
- In order to enhance coastal security and to provide round-the-clock surveillance for the state's non-major ports, a central command and control centre is being planned at Gandhinagar. This centre will be linked through an extensive network of alarms and CCTV cameras at Gujarat's ports and will include sea-facing thermal cameras to monitor the vast expanse of sea surrounding the ports and night vision devices to keep a tab on all movements. The proposed plan is to begin with six non-major ports—namely Navlakhi, Madgalla, Okha, Jamnagar, Porbandar and Dahej.
 - The government has allotted 250 acres of land in Dwarka to set up the National Marine Training Institute, which will provide specialised courses on border and coastal security. The institute is to be established by the Bureau of Police Research & Development (BPR&D) in association with the Indian Institute of Technology (IIT), Chennai, to design jetties for the location.

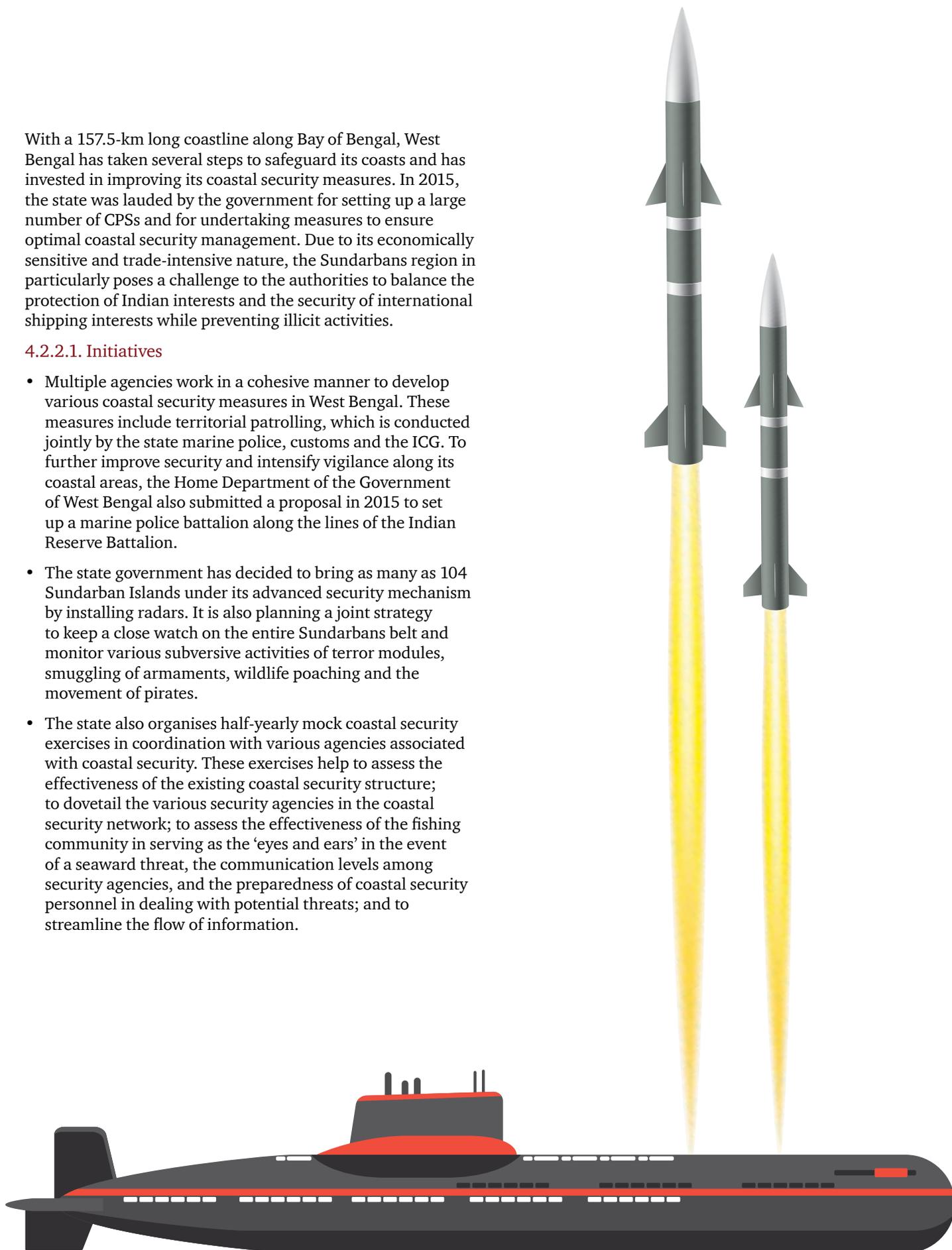
4.2.2. West Bengal



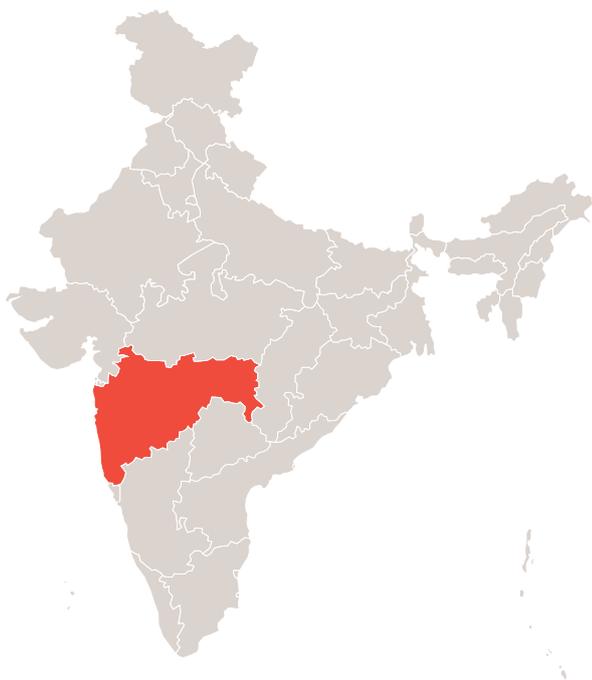
With a 157.5-km long coastline along Bay of Bengal, West Bengal has taken several steps to safeguard its coasts and has invested in improving its coastal security measures. In 2015, the state was lauded by the government for setting up a large number of CPSs and for undertaking measures to ensure optimal coastal security management. Due to its economically sensitive and trade-intensive nature, the Sundarbans region in particular poses a challenge to the authorities to balance the protection of Indian interests and the security of international shipping interests while preventing illicit activities.

4.2.2.1. Initiatives

- Multiple agencies work in a cohesive manner to develop various coastal security measures in West Bengal. These measures include territorial patrolling, which is conducted jointly by the state marine police, customs and the ICG. To further improve security and intensify vigilance along its coastal areas, the Home Department of the Government of West Bengal also submitted a proposal in 2015 to set up a marine police battalion along the lines of the Indian Reserve Battalion.
- The state government has decided to bring as many as 104 Sundarban Islands under its advanced security mechanism by installing radars. It is also planning a joint strategy to keep a close watch on the entire Sundarbans belt and monitor various subversive activities of terror modules, smuggling of armaments, wildlife poaching and the movement of pirates.
- The state also organises half-yearly mock coastal security exercises in coordination with various agencies associated with coastal security. These exercises help to assess the effectiveness of the existing coastal security structure; to dovetail the various security agencies in the coastal security network; to assess the effectiveness of the fishing community in serving as the 'eyes and ears' in the event of a seaward threat, the communication levels among security agencies, and the preparedness of coastal security personnel in dealing with potential threats; and to streamline the flow of information.



4.2.3. Maharashtra



Maharashtra has one of the most industrially prosperous coastlines in the country that spans 652.6 km. However, it is also vulnerable to several anti-national activities, including terrorism, illegal, unreported and unregulated fishing, and smuggling of gold, explosives, narcotics, arms and ammunition and other goods. The explosives used in the 1993 serial attacks in Mumbai were smuggled through the Raigad coast in Maharashtra. Further, terrorists eluded the Maharashtra coastal police in 2008 and were able to carry out an attack in Mumbai that resulted in 170 casualties. These incidents have exposed the vulnerability of Maharashtra's coastal regions and various steps have been taken since then to improve coastal security.

4.2.3.1. Initiatives

- Maharashtra has begun colour-coding fishing boats district-wise rather than assigning a common colour to all boats registered in the state. This is being done to make the identification of any intruders easy. Further, since 2015, the Mumbai police have been using 18 boats to patrol Mumbai's coastline every day. These boats are operated by personnel from CPSs in the port zone.
- The government has taken several steps to update technological surveillance units along the Maharashtra coastline in order to increase coastal security. A recent idea being discussed is to install high-resolution surveillance cameras on high-rise buildings in Mumbai to monitor the shore. Additionally, to prevent boats from crossing over the national internal maritime boundary with Pakistan, state governments have initiated a scheme of registering boats with the customs department and equipping them with global positioning system (GPS) and very high frequency (VHF) wireless sets.

4.2.4. Tamil Nadu



The southern-most state of Tamil Nadu has a 1,076-km long coastline, making it the second largest coast in the country. The Tamil Nadu coast is home to 12 coast houses, 2 major seaports, 13 minor seaports, fishing harbours and a variety of coastal industries such as nuclear thermal power plants, refineries, fertilisers and marine chemicals. Around 1.05 million fishermen operate from approximately 591 marine villages with the help of around 45,181 traditional crafts and 5,596 mechanised boats. Situated at the meeting point of the Indian Ocean, the Bay of Bengal and the Arabian Sea, Tamil Nadu witnesses harsh storms and heavy rains, with the state also having suffered from tsunamis in the past. Furthermore, its proximity to Sri Lanka's borders requires extensive cooperation between state agencies, thus making maritime security integral for Tamil Nadu's coast.

4.2.4.1. Initiatives

- Established in 1994, the Coastal Security Group (CSG) is the state's local police force. With around 32 operational CSP stations, Tamil Nadu has the highest number of CPSs along its coast which are equipped with 24 boats and 24 ATVs. The CSG is in the process of procuring unmanned robotic boats to monitor intruders and terrorists remotely. The boats will be fitted with manoeuvrable HD cameras with infrared capabilities. They will also have a network of sensors that will transmit messages and images of suspicious activities along the coast. Tamil Nadu's Department of Fisheries provides the fishing community with socioeconomic welfare schemes and is responsible for their general welfare, including physical security, for which it coordinates with other state police forces. The following are the few initiatives taken up by the CSG to ensure better security in the territorial waters:

- 363 fishermen from 13 coastal districts were appointed as Marine Home Guards on a daily wage basis to assist the Marine Police in beat service, rescue and relief of fishermen, disaster management work and maintenance of fast interceptor boats. They further strengthen maritime defence in the territorial waters under the supervision of the Marine Police.
- A Marine Quick Reaction Team was formed with a group of 25 policemen, who were given special training in commando skills to equip them for any exigency, including low-intensity conflicts at sea.
- The Trichy Customs and Central Excise Collectorate has jurisdiction over the entire state except the areas that come under the jurisdiction of the Commissioner of Customs, Seaport, Chennai and Customs Airport, Chennai and Tuticorin Customs Commissionerate. It operates primarily from the coasts, with 20 of the 23 preventive field formations situated at the shore, and is mainly involved in curbing smuggling activities as the India-Sri Lanka coastal belt is increasingly becoming a hub for smuggling items such as gold and heroin.

4.2.5. Andhra Pradesh



Andhra Pradesh lies in a strategically advantageous corner in southeast India and has a 975-km long coast that consists of 4 major and 10 minor ports that serve as India's gateways to East and Southeast Asia. The 4.93 crore people that reside in the state and the 3.13 lakh fishermen that operate over 70,000 vessels on the coast experience varying climatic conditions as droughts in the summer turn to severe floods and cyclones with the arrival of the monsoons. Adding to the effects of difficult weather is the porousness of the Andhra Pradesh coast, which leaves it vulnerable to smugglers of narcotics and ammunition and terrorist infiltration. These threats, along with fears that the Indian government is more focused on the western coast post the 26/11 attacks, raise Andhra Pradesh to a high-priority standing in the marine security sphere.

4.2.5.1. Initiatives

- Much like several other coastal states, Andhra Pradesh also has its local CSP. Although its CSP is funded by the Centre, it is manned by the state government and has its own armament and specialised units, including a commando strike force. In collaboration with the CSP, the anti-terror unit Organisation for Counter Terrorist Operations (OCTOPUS) provides an additional layer of protection to the coast by monitoring possible terrorism-related activities within the state.
- The state is also in the process of finalising the creation of its own maritime boards. Although the revised Maritime Board Bill was drafted in 2015, procedural delays mean that Andhra Pradesh still lacks an independent authority in charge of its coastline. The bill has been approved in the State Legislative Assembly and the Cabinet, but is awaiting approval from the President of India and the Andhra Pradesh Governor.
- In March 2017, the Centre for Human Security Studies (CHSS), in association with the Andhra Pradesh police, organised a workshop that was attended by delegates from the Philippines, Thailand, Singapore, South Africa, Israel, the US, Japan, the Institute of Defence Studies and Analyses, New Delhi, and other such academic institutions. The sole topic of discussion was the security of the Andhra Pradesh coastline, which is at the forefront of the state government's agenda under the set of maritime security policies called Mission 974.
- The Customs Preventive Commissionerate monitors the entire Andhra Pradesh coast except for Vishakapatnam Custom House and Yanam, Puducherry to counter smuggling, illegal trade and unauthorised entry of boats into domestic territories. Headquartered at Vijayawada, the customs force conducts sea patrolling, coastal patrolling and shore surveillance from their bases at airports, seaports, Inland Container Depots and Customs Preventive Divisions.

4.2.6. Goa



Goa has a coastline of 101 km. Mormugao is its only major port and the state has only two districts, North and South Goa, both of which are coastal. As a result, coastal security is of paramount importance to the state.

4.2.6.1. Initiatives

- Goa has about 555 km of inland waterways, of which only 255 km are navigable through the rivers and tributaries that flow through the state. The Captain of Ports Department has been set up in Goa in order to maintain and develop these inland waterways and the minor ports in the state through periodic hydrographic surveys, dredging of rivers, maintenance of lighthouses and beacons, and provision of necessary navigational aid and training to necessary personnel. With this development, the state will have more opportunities to improve its coastal security measures and prevent intrusions.
- The Government of Goa also formed the State Maritime Security Committee (SMSC) in December 2016, which serves as a substitute for the State Maritime Board (SMB). The SMSC is efficient in smaller states which don't have enough coastal activity to justify the setting up of an SMB. The SMSC is headed by the Chief Secretary and includes the Secretary of Ports as well as representatives from the Indian Navy, Indian Army, Goa Police, Commissioner of Customs and Commissioner Special Bureau. Its duties include reviewing security arrangements and regulatory aspects of the riverine zone in the state, recommending necessary actions in the interest of maritime security, looking into timely implementation of proposals pertaining to maritime coastal security and maintaining effective coordination among state- and central-level agencies.

4.2.7. Kerala



With a coastline spanning 569.7 km, Kerala has the fifth longest coastline in the country. It has one major port, namely the port in Kochi, along with 3 intermediate and 14 minor ports. The state has taken several steps to safeguard its coasts, prevent intrusions and minimise the occurrence of illegal activities.

4.2.7.1. Initiatives

- In order to safeguard its coasts, Kerala had set up a coastal police force that operates out of CPSs set up under the CSS to add an extra layer of protection and prevent the intrusion of any anti-national elements or illicit items through the sea. The coastal police force also helps to coordinate among related agencies, including the state police, Indian Navy, ICG and Department of Fisheries and Customs. This helps to improve the quality of coastal policing in the region. The coastal police has taken several initiatives to improve its ability to patrol, including submitting proposals for the construction of coastal police headquarters, a coastal police battalion and acquiring ATVs for 18 CPSs.
- The state also has a Department of Ports where the intermediate and minor ports under the administration of the state government are administered by the Director of Ports headquartered in Thiruvananthapuram.
- Additionally, in 2016, the state decided to conduct Kadalora Jagratha Samithi (Coastal Awareness Committee) meetings on a monthly basis to move one step closer to ensuring a watertight coastal security mechanism.

4.2.8. Karnataka



Karnataka has a coastline spanning 280 km along the Arabian Sea. The state also has 17 islands, 1 major and 10 non-major ports.

4.2.8.1. Initiatives

The state set up a CSP in 1999, which is headed by an Inspector General of Police, followed by a Superintendent of Police and other staff. It has a jurisdiction of about 320 km over Karnataka's coastal waters—from Talapady in Dakshina Kannada to Sadashivgad in Uttara Kannada—and is responsible for policing illicit activities and intrusions. The Public Works Department (PWD) is responsible for managing the ports through the Director of Ports and Inland Water Transport. A proposal to establish an SMB in Karnataka was approved in 2015.



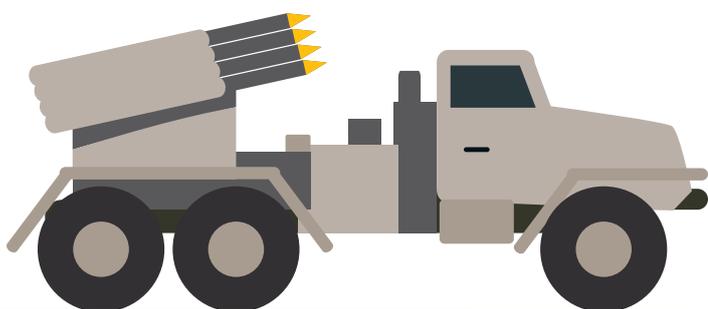
4.2.9. Odisha



Odisha has a 476.4-km coastline which is vulnerable to the export/import of illegal arms and other contraband articles via its sea route and unauthorised fishing and intrusion of anti-national elements from neighbouring countries. As a result, maritime security preparedness is of utmost importance in Odisha.

4.2.9.1. Initiatives

- Odisha recently formed a State Level Committee (SLC) for coastal security, the first meeting of which was held in February 2017. In the meeting, the state requested for assistance from the Centre, specifically the MHA, to provide additional boats customised for the state, along with provisions to run, patrol and maintain these boats. The state has also claimed that it is going to intensify training procedures for marine security personnel as well as awareness within the fishing community in order to improve coastal security measures. The state has also issued identity cards to fishermen going into the sea. Additionally, the state requested the Indian Navy to impart training to state marine police personnel on coastal and maritime security starting July 2017. The training is set to focus on standard operating procedures (SOPs) during counterterrorism operations and seamanship and tracking illegal trawlers and pirates. The personnel will also be acclimatised with weather conditions while at sea, efficient use of radars and identification of friend and enemy boats while patrolling. Other steps taken by the state government have been the decision to put all boats plying through the coast under surveillance, colour code boats to make identification easier and install a transponder in every boat to facilitate surveillance.
- The Department of Fisheries and Animal Resource Development, Government of Odisha, has installed Distress Alert Transmitters (DATs) in sea-going boats in order to protect fishermen. In the event of an emergency or distress, the fishermen can reach the ICG or Indian Navy personnel. Thus far, 2,000 of the required 8,000 DAT machines have been installed.



5

Challenges and way forward



Though India is a peninsular country with two-third of its borders surrounded by water, it has been lenient in terms of the emphasis on its coastal and maritime security as compared to that on the security of its land borders. Looking back at India's history, the country's great empires have used the sea for trade and prosperity and not for building their military or commercial might. In ancient times, Indians used sea as well as land routes for the trade of luxury goods such as spices, gold, precious stones, leather of rare animals, ebony and pearls. The world's first tidal dock was built by the Harappan Civilisation near the present day Mangrol harbour on the Gujarat coast; however, no strong navies were maintained. Back in 1500, the Portuguese were the first to invade India; they arrived by sea and colonised Goa—a state they continued to rule till India liberated it in December 1961. It was in the late eighteenth century that the Maratha Navy fought for the first time against the European naval interests on the coasts of India. The trend of relatively less focus on coastal and maritime security has persisted despite the fact that there have been infiltrations across India's coast in the form of smuggling and illicit trade. It was only post the 1993 Mumbai blasts that a three-tier structure, consisting of the Indian Navy, the ICG and a joint patrol comprising personnel from the first two as well as from the state police, the customs department and other agencies, was set up.

Today, emphasis is being placed on the coastal security infrastructure in India; however, the threats to coastal security are varied and complex:

- The remoteness of the vast coastline makes coastal areas susceptible as boats can land stealthily without being detected.
- The creek areas of Gujarat and the Sunderbans are particularly vulnerable to clandestine activities as they are interconnected through small islands where mangroves and sandbars provide shelter.
- Dhows (large wooden boats), which are extensively used for trade, are often involved in illicit trade and smuggling.
- Fencing of land borders has increased infiltration through sea routes.
- Discovery of vast hydrocarbons within the Indian EEZ has complicated the situation.

Some of the key challenges that impact the sector are discussed below.

5.1. Key challenges

5.1.1. Multi-level structure

There are approximately 15 agencies involved in various facets of coastal security, and coordination between these agencies is important. Involvement of states and the Centre leads to inadequate utilisation of resources, which is one of the major largest impediments to the implementation of the coastal security initiatives. Owing to the multi-stakeholder problems, there is a need for a comprehensive understanding of the fiscal allocation towards various schemes and innovative solutions.

5.1.2. Technology

Another challenge is the role of technology in coastal security, as after the Mumbai attacks, it became essential to ensure that the security of coasts was on par with that of border outposts. Coastal radar systems, sensors and electronic surveillance systems have been installed over the last eight years to monitor maritime traffic. The latest audit showed only about 1,000 vessels were actually equipped with the tracking facility. This coverage needs to increase considerably to provide an accurate assessment of maritime traffic. Only boats over 20 m in length are eligible for the AIS. However, this policy needs to be revisited as smaller boats can move past security layers unnoticed.

5.1.3. Research and customisation issues

Coastal security in India presents a unique challenge for security agencies in terms of the conditions of operation and tasks assigned. This requires the development of India-specific innovative solutions and research by the stakeholders. Research and customisation are also important to synergise the technological systems used by the various agencies involved in coastal security. Seamless integration of capabilities is also essential in the case of hardware such as radars, cameras and AIS. This will ensure the interoperability of security hardware across the various security forces.

5.1.4. Domestic industrial base

Statistics indicate that India needs to start investing heavily in the manufacturing of security equipment to become a self-reliant country by 2025. The gap between demand for security equipment and capacity of the domestic industries must be filled by encouraging foreign participation in the Indian coastal security market. Given that many aspects of coastal security—that is, protection of infrastructure and urban surveillance—are not as sensitive as the defence sector, in order to promote the domestic industrial base, we need to revisit the requirements for establishing joint ventures under the FDI policy proposed in 2016, which imposes a cap of 49% for foreign investors.

5.1.5. Challenges across schemes

The key challenges being faced across various schemes are as follows:

5.1.5.1. CSS

- Multiple stakeholders make coordination and execution of coastal security measures a challenge, resulting in limited focus from the Central and state government
- Inadequate arrangement for maintenance of boats
- Provision of jetties in the vicinity of marine police stations
- Delays in the creation of shore-based infrastructure
- Manpower shortages along with inappropriate training
- Unavailability of a monitoring mechanism to monitor coastal security across coastal states and union territories

5.1.5.2. Sagarmala

One key concern for the implementation of this project is the imbalance between the demand and supply of skilled manpower in coastal districts. In order to address the issue, the project has proposed a massive training drive among the people in the coastal regions to meet the demand requirement. Other concerns include the environmental effects on the coasts like coastal erosion, coastal accretion as well as severe problems of dredging and the effects of port-led activities on the seabed.

5.1.5.3. Operation Swan

Though the task was well defined, the execution through small teams posed many challenges. The endurance of ICG interceptor craft is about four to six hours and the limited night patrolling capabilities need to be improved. Weather is also a major impediment as there is a virtual suspension of patrolling in monsoons/rough weather conditions. The quantum of traffic of small vessels in minor ports poses another major challenge in terms of monitoring as there are hundreds of fishing boats and dhows operating from the minor ports of Maharashtra and Gujarat on a daily basis.

5.2. Way forward

The threats and challenges being faced by various agencies need to be addressed in order to deploy an effective coastal security mechanism across the Indian coast. Smuggling of drugs and contraband, illegal unreported and unregulated fishing, and flow of migrants from neighbouring countries are variables that underscore the need for coastal protection. However, unlike the rest of the world, India has the advantage of a shallow gradient on the west coast, which provides natural protection from underwater threats. There is much that can be done to counter the threats and challenges which are posed to coastal security. Some recommendations are listed below:

- Consolidation of various stakeholders (as mentioned in Chapter 2)
- More cooperation between State and Central government agencies

- MHA to concentrate on training of marine police with recruitment of talented local fishermen and provision of incentives such as sea duty allowance
- Inclusion of private players in maritime security
- Integration of marine police in the coastal security chain to track coastal fishing activity
- Setting up of Central Marine Police Force to standardise equipment and seamlessly integrate all the realms of coastal security
- Fast-tracking the setting up of the National Marine Police Training Institute in Dwarka (Gujarat), followed by intense interaction between the institute and the Marine Police Training Centres in state and UTs
- All coastal states and UTs to set up maritime boards
- Setting up of a multi-disciplinary National Maritime Authority (NMA) under the aegis of MHA
- Creation of modern fishing harbours as part of Sagarmala
- Strengthening the human intelligence (HUMINT) capability
- More emphasis on port security infrastructure
- Deployment of a satellite constellation for coastal surveillance
- Creation of a joint technical cadre along with logistics infrastructure for maintenance of boats used for patrolling so as to address the issues related to operational availability of these assets
- Optimum utilisation of funds allocated under the CSS
- Enactment of the Coastal Security Bill which has been pending since 2013
- Creation of the National Coastal Security Corps (NCSC) of National Cadet Corp (NCC)
- Increased interaction with other countries so as to adopt and customise the best practices being followed by them
- Formulation of standards and policy for the procurement of equipment for coastal security
- Induction of hovercraft and unmanned aerial vehicles (UAVs) as part of the CSS



6

International examples



6.1. France

With its abundant coastal areas and the diversity of its overseas departments and territories, France is a major maritime nation. In addition to the size of the area under France's sovereignty and jurisdiction, as 95% of its borders are coastal areas, the country's economy, its industry and its diplomacy are focused on them. Therefore, the security of this strategic area is essential.

France has created a national strategy to ensure maritime security. This strategy is intended to offer a coherent national inter-ministerial framework to improve the fight against maritime insecurity. It is based on an analysis of short- and medium-term maritime risks and threats that are likely to affect the strategic interests of France and its partners. It also aims to define common objectives and order priorities to ensure France's sovereignty and sovereign rights over its maritime areas, both off France and off its overseas territories, to contribute to the maritime security of the European continent. The strategy also supports the international action of France with its partners and international organisations and its contribution to the growth of Europe by ensuring conditions that are favourable to an ambitious development

policy. The main focus of this strategy is to control France's maritime areas, protect its nationals and ships, fight illegal trafficking at sea, defend France's economic interests and promote a safe international maritime domain. France has also been very forward-thinking with the development of its national strategy and has determined its areas of focus for the future. The five avenues for progress identified by France are improving the inter-ministerial governance of state action at sea, supplementing France's body of law, developing new technological tools, improving knowledge of the maritime situation in all areas of the globe where its interests are at stake and developing synergies, both with private players and international partners.

As a coastal security measure, France complies with the European Union Maritime Security Strategy (EUMSS). Through this strategy, France intends to assert its rights and assume its duties by ensuring, through coherent and coordinated actions, the free, safe and sustainable use of seas, thus confirming its rank as a major maritime power and its intention for economic development through its seas. The EUMSS is an overarching maritime security strategy against all the challenges from the global maritime domain that may affect people, activities or infrastructures in the European Union (EU). The strategy is built on closer collaboration within the EU on a regional and national level, and seeks to increase awareness and ensure higher efficiency of operations. The primary objective is to protect the maritime interests of the EU. The EUMSS strengthens the link between internal and external security and couples the overall European Security Strategy with the Integrated Maritime Policy. By working closely and planning for the future, the EU and its member states can make better use of the existing resources and enter into more effective and credible international partnerships.

More than a quarter of the operational activity of the French Navy's vessels and aircraft is devoted to maritime security and safety. Maritime security and safety encompasses all the operations that the navy carries out to ward off threats from the sea (terrorism, drug trafficking, acts of piracy, illegal movement of migrants, etc.), defend sovereignty and sovereign rights at sea, and control risks relating to maritime activities (accidents at sea, pollution, legacy munitions clearance, etc.). State action at sea covers maritime operations carried out by the government in public interest using its own resources and does not include defence-related missions. State action at sea focuses on fighting maritime crime, drug trafficking, illegal immigration, fisheries patrol and enforcement, pollution and accident prevention, sea rescue and assistance, and mine clearance.

SPATIONAV, a wide area sensor network dedicated to providing France with a continuous view of its sea, was established to monitor maritime approaches and combine information coming from various sensors, including those of the regional surveillance and maritime rescue coordination centres. Land patrols of the departmental or maritime gendarmerie units, as well as of the national police and customs, in their zones and domains of competence supplement SPATIONAV.

6.2. Japan



The Japan Maritime Self-Defence Force (JMSDF) is the naval branch of the Japan Self-Defence Forces tasked with the naval defence of Japan. The JMSDF routinely and continuously engages in surveillance activities in the waters surrounding Japan so that it can respond to various emergencies promptly and seamlessly.

The JMSDF routinely patrols the waters surrounding Hokkaido, the Sea of Japan and East China Sea, using P-3C fixed-wing patrol aircraft to monitor the numerous vessels that sail through those waters. Furthermore, surveillance activities are conducted with the flexible use of destroyers and aircraft, as required. Thus, a state of readiness is maintained for responding quickly to situations in the areas surrounding Japan. In addition, coastal surveillance units and JMSDF security posts conduct 24-hour surveillance activities along Japan's major sea straits. Further, the MSDF is enhancing its capabilities to detect, identify and track foreign submarines navigating underwater in the territorial waters of Japan and improving its capabilities for responding to them in shallow waters. The MSDF is taking the following steps:

- Deploying missile boats
- Establishing the MSDF special boarding unit
- Equipping destroyers with machine guns and maritime interdiction equipment such as flat-nose shells
- Improving the efficiency of essential military vessel personnel

In addition, Japan's Ministry of Defence and the Japan Coast Guard carry out regular mutual training programmes, information exchange, joint exercises, etc. A Manual on Joint Strategies concerning Unidentified Vessels was prepared jointly by the Defence Agency and the Japan Coast Guard in 1999. Additionally, the JMSDF and the Japan Coast Guard carry out joint exercises involving pursuit and capture guidelines for unidentified vessels and communications, etc., thus strengthening cooperation between the two organisations.

Japan has pursued a grand strategy of creating an East Asian maritime order, with a special emphasis on situating a US-Japan-China trilateral arrangement based on cooperative security at the core of an East Asian maritime regime. The US, India and Japan also participate in the annual Malabar series of naval drills in the North Indian Ocean. The exercise involves both ashore and at-sea training. Ashore and sea training includes exchanges on carrier strike group operations, maritime patrol and reconnaissance operations, surface operations and anti-submarine warfare (ASW), explosive ordnance disposal (EOD) and visit, board, search and seizure (VBSS) operations.

6.3. Russia



In order to ensure safety of navigation in Russian waters, a reliable system of navigation equipment has been created. This system includes 399 luminous beacons, 2,538 lighted and unlighted navigation marks, 148 radar beacons, transponders and 45 stations of radio navigation systems.

Russia has deployed Bastion-P and Bal, SSC-6 missile systems that are capable of engaging different classes and types of surface ships. Moreover, the country has deployed a ground-based Bastion system off the coast of Crimea and three fully operational Bal missile battalions, out of which two have been deployed with the Black Sea Fleet and one with the Pacific Fleet.

In accordance with the SOLAS convention, the Ship Security Alert System (SSAS) has been deployed. Further, Russian ship owners have also had their vessels fitted with SSAS. The Russian Sea Shipping Register is also carrying out control measures to fulfil the technical requirements for setting up SSAS equipment on vessels.

6.4. UK



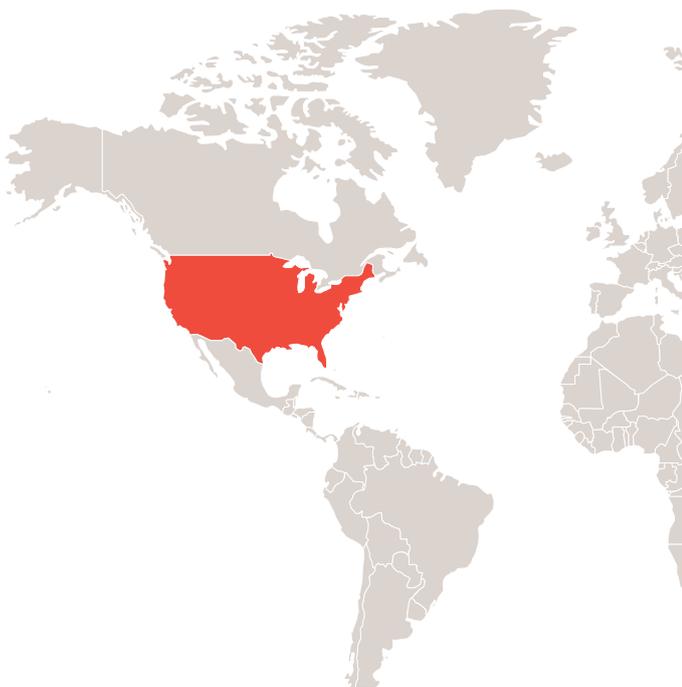
The National Maritime Information Centre (NMIC) brings together information and intelligence provided by the Border Force, the police, the armed forces, the Foreign and Commonwealth Office, the Marine Management Organisation, the National Crime Agency (Border Policing Command) and other agencies. Also, through its international partnerships, the centre incorporates additional global information to provide the UK with unified situational awareness of maritime activity in its national and international waters. The role of the NMIC is:

- To monitor and track maritime activity around the UK and areas of national interest, and collate that data within a trusted environment.
- To analyse and share information, enabling better understanding of maritime security issues.
- To act as a national focal point for regional and international partners on maritime domain awareness.
- To support government and industry decision making in times of need.
- To respond to government department and agency tasking to support their outputs on a case-by-case basis.

To improve its maritime defence, the Royal Navy is planning to step up its use of artificial intelligence (AI) with STARTLE—an AI software that can spot potential threats. This software works by using a neural network and machine learning to process information and flag warning signs in a way similar

to the fear condition system found in mammalian brains. VTS charting is also increasing in sophistication. Progressing from a simple chart-like graphical representation, VTS centres are now equipped with Electronic Chart Display and Information System (ECDIS) style charting, along with the capability to manage the chart to display appropriate levels of data. VTS personnel will be responsible for monitoring numerous vessels in their area of responsibility. It can therefore be challenging for VTS to provide a full level of oversight equivalent to that offered by a vessel's individual bridge team. As such, a concept of behavioural recognition has been adopted by VTS. Further, VTS areas often consist of defined areas of waterways, including fairways, routes, anchorages and areas of special interest. All of these factors are currently monitored by a human VTS operator, although an increased level of automated surveillance of maritime traffic support is being provided to the operators.

6.5. US



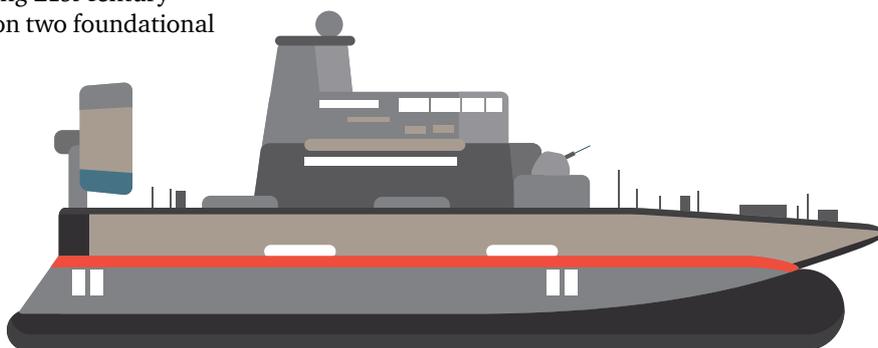
In 2015, the US Navy, Coast Guard and Marine Corps released a revised maritime strategy titled 'A Cooperative Strategy for 21st Century Seapower', calling for all domain access, US forward naval presence and emphasising cooperation between the US and its allies in the face of various global maritime challenges. To face this perplexing 21st century threat environment, the strategy focuses on two foundational

principles. First, forward naval presence is deemed essential to defend the homeland, deter conflict, respond to crises, defeat aggression, protect maritime commons, strengthen partnerships, and provide humanitarian assistance and disaster response. Second, the strategy emphasises joint operations with allies and partners.

In the aftermath of the terrorist attacks on 11 September 2001, the US Customs Service created the Container Security Initiative (CSI), which addresses the threat to border security and global trade posed by the potential threat of terrorists using maritime containers to deliver weapons. CSI proposes a security regime to ensure all containers that pose potential terrorism risks are identified and inspected at foreign ports before they are placed on vessels destined for the US. The three core elements of the CSI are:

- Identify high-risk containers based on automated targeting tools to identify containers that pose a potential risk for terrorism, based on advance information and strategic intelligence.
- Pre-screen and evaluate containers before they are shipped as early in the supply chain as possible, generally at the port of departure.
- Use technology to pre-screen high-risk containers to ensure that screening can be done rapidly without slowing down the movement of trade. This technology includes largescale X-ray and gamma-ray machines and radiation detection devices.

The Free and Secure Trade (FAST) programme (a joint US-Canada and US-Mexico programme) and the Customs-Trade Partnership Against Terrorism (C-TPAT) programme (a public-private supply chain security initiative) are two other well-known examples of post 9/11 initiatives that seek to provide increased security while providing expedited customs clearance to pre-vetted shipments. The US Navy's pioneering Sound Surveillance System (SOSUS) became a key long-range early-warning asset for protecting the US against the threat of Soviet ballistic missile submarines and providing vital cueing information for tactical, deep-ocean, anti-submarine warfare. The development of SOSUS began in 1949 as a tactical, long-range means of countering the emerging Soviet submarine threat, most of which were still running on easily trackable diesel engines. Today, the Navy maintains a number of SOSUS arrays in operational and standby status. Existing arrays have achieved successes in tracking migrating whales and detecting illegal driftnet fishing on the high seas.





India's Coastline and island territories

- Indian Yearbook
- Encyclopædia Britannica. Total area excludes disputed territories not under Indian control.
- http://mha.nic.in/sites/upload_files/mha/files/BM_MAN-IN-PAKS-060513.pdf
- http://mha.nic.in/sites/upload_files/mha/files/BM_MAN-IN-BANG-270813.pdf
- <https://www.ibef.org/download/Ports-June-2017.pdf>
- <http://thediplomat.com/2016/01/the-strategic-importance-of-andaman-and-nicobar-islands/>
- <http://www.factsninfo.com/2015/06/physical-geography-of-india-facts.html>

Maritime zones defined by the UN Convention on the Law of the Sea: <https://thewire.in/138483/maritime-territory-continental-shelf-unclos-india/>

Indian Coast Guard: <http://indiancoastguard.gov.in/content/index.aspx>

Ministries of Fisheries: <http://dahd.nic.in/about-us/divisions/fisheries>

Directorate General of Lighthouse and Lightships: http://www.dgll.nic.in/content/73_1_NAIS.aspx

The Maritime Zones of India act 1976: Indian Coast Guard <http://indiancoastguard.gov.in/content/index.aspx>

Border disputes

- New Moore
 - <http://archive.indianexpress.com/news/new-moore-no-more-rising-sea-claims-island-in-bay-of-bengal/594929/>
 - <http://www.ndtv.com/india-news/un-tribunal-resolves-40-year-old-maritime-dispute-between-india-and-bangladesh-587571>
- Gulf of Kutch
 - Indo-Pak composite dialogue: No movement on Sir Creek talks, by Zahid Gishkori, Express Tribune
 - Bharat Bhushan, Tulbul, Sir Creek and Siachen: Competitive methodologies, South Asian Journal, No. 7 Jan–Mar 2005

- Palk Strait
 - Map of Sri Lanka with Palk Strait and Palk Bay
 - Adam's bridge. Encyclopædia Britannica. 2007.
 - Sri Lanka, India to relaunch ferry service after three decades
 - <http://thediplomat.com/2017/01/india-sri-lanka-revisit-palk-strait-fishing-dispute-in-ministerial-talks/>

Budget analysis: <http://mha.nic.in/>

Key stakeholders

- Ministry of Home Affairs: <http://mha.nic.in/>
- Indian Coast Guard: <http://joinindiancoastguard.gov.in/>
- Border Security Force: <http://bsf.nic.in/>
- Central Industrial Security Force: <http://www.cisf.gov.in/>
- Ministry of Shipping: <http://shipping.gov.in/>
- Ministry of Fisheries: <http://dahd.nic.in/about-us/divisions/fisheries>

Central Coastal Security Scheme

- http://mha.nic.in/sites/upload_files/mha/files/coastal_security_31052017.pdf
- <http://mha1.nic.in/par2013/par2016-pdfs/lr-260716/1574%20E.pdf>
- <http://164.100.47.190/loksabhaquestions/annex/11/AS64.pdf>
- <http://thediplomat.com/2016/11/8-years-after-the-2611-mumbai-attacks-a-review-of-indias-coastal-security/>
- <http://www.deccanchronicle.com/nation/current-affairs/270816/phase-ii-of-coastal-security-scheme-still-incomplete.html>

International Ship and Port Facility Security (ISPS) Code

- Director General of Shipping: <http://dgshipping.gov.in/Content/DGSCirculars.aspx?branchid=24>
- Shipping Corporation of India Ltd: <http://www.shipindia.com/fleet/ism-isps/isps-cell.aspx>
- World Cruise - maximum security - cruise ships secure from terrorist threats
- What are the duties of Ship Security Officer (SSO)? Marine Insight. 2012-06-02
- www.imo.org
- www.uscg.mil
- <http://www.marineinsight.com/maritime-law/isps-codethe-911-after-effect/>

National Automatic Identification System (AIS)

- Directorate General of Lighthouse and Lightships:
 - http://www.dgll.nic.in/content/73_1_NAIS.aspx
 - Regulations for carriage of AIS. Imo.org.
 - EMC Analysis of Universal Automatic Identification and Public Correspondence Systems in the Maritime VHF Band (pdf). Transition.fcc.gov.
 - <http://www.dgll.nic.in/WriteReadData/Pdf/16cc467f-41f9-4e7f-964e-7d7ec716c5f4.pdf>

Biometric Identity Cards to Coastal Fishermen

- Department of Fisheries: <http://dahd-archive.nic.in/dahd/division/fisheries/issuance-of-biometric-identity-cards-to-coastal-fisherman.aspx>
- <http://www.thehindu.com/news/cities/Visakhapatnam/Biometric-ID-cards-being-issued-to-fishermen/article14494118.ece>

Vessel Tracking Management System

- Directorate General of Shipping: <http://dgshipping.gov.in/>
- <http://www.marineinsight.com/marine-safety/the-importance-of-vessel-tracking-system/>

Coastal Surveillance Network

- Indian Coast Guard: http://indiancoastguard.gov.in/content/1727_3_CosstalSecurity.aspx
- <http://www.newindianexpress.com/nation/2017/feb/21/government-approves-800-crore-for-coastal-security-surveillance-1573168.html>

Community Interaction Programme

- <http://timesofindia.indiatimes.com/city/mumbai/Coast-guard-interacts-with-fishermen-community-on-coastal-security/articleshow/53211334.cms>

Sagarmala

- Ministry of Shipping: <http://sagarmala.gov.in/>
- <http://pib.nic.in/newsite/PrintRelease.aspx?relid=159037>
- <http://economictimes.indiatimes.com/opinion/interviews/sagarmala-is-a-very-ambitious-project-of-the-indian-government-rajive-kumar-shipping-secretary/articleshow/57788686.cms>
- <http://www.livemint.com/Politics/r8inQCDOqJU8uBs65GuxN/Sagarmala-programme-India-to-train-13-million-people-acros.html>
- <http://www.firstpost.com/india/sagarmala-project-proposes-14-coastal-economic-zones-across-india-3130866.html>

Operation Swan

- <http://www.salute.co.in/sentinels-on-the-coast-saga-of-operation-swan/> (dated December 2015)
- http://www.cag.gov.in/sites/default/files/audit_report_files/Union_Performance_Defence_Services_Role_and_Functioning_Indian_Coast_guard_7_2011_chapter_5.pdf

State initiatives

- Gujarat
 - Gujarat Maritime Board: <http://www.gmbports.org/>
 - <http://www.orfonline.org/expert-speaks/why-indias-coastal-security-project-is-still-a-work-in-progress/>
 - <http://www.deccanchronicle.com/nation/current-affairs/270816/phase-ii-of-coastal-security-scheme-still-incomplete.html>
 - <http://deshgujarat.com/2016/08/24/60-cops-from-gujarat-marine-police-to-undergo-indian-navy-training/>
- West Bengal
 - http://policewb.gov.in/wbp/misc/COASTAL_SECURITY_SCHEME.pdf
 - <http://www.asianage.com/metros/kolkata/260717/only-40-per-cent-boats-fitted-with-tracking-device.html>
 - <http://www.financialexpress.com/india-news/west-bengal-frames-its-first-draft-maritime-policy/358881/>
 - <http://timesofindia.indiatimes.com/city/kolkata/Stakeholders-discuss-security-challenges-along-West-Bengal-coastline/articleshow/54352643.cms>
- Maharashtra
 - <http://www.livemint.com/Politics/ZiD6LX38qRHt1TZIe5ZQZJ/Bid-to-strengthen-security-infrastructure-across-coastal-sta.html>
 - <http://www.thehindu.com/news/cities/mumbai/Maharashtra%E2%80%99s-coastal-security-still-porous/article14018620.ece>
 - <http://www.hindustantimes.com/india-news/maritime-terror-major-threat-but-indian-coasts-secure-rajnath-singh/story-PWkgpnKzrM3jicDI5tFjLM.html>
 - http://164.100.47.193/intranet/Coastal_Security.pdf
- Tamil Nadu
 - <http://www.tnmaritime.com/policy.php>
 - <http://www.livemint.com/Politics/ZiD6LX38qRHt1TZIe5ZQZJ/Bid-to-strengthen-security-infrastructure-across-coastal-sta.html>
 - <http://www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/Elaborate-coastal-security-scheme-to-check-smuggling/article14716141.ece>
- Andhra Pradesh
 - <http://www.thehindu.com/todays-paper/tp-national/tp-andhrapradesh/coastal-security-network-needs-to-be-strengthened/article17531073.ece>
 - <http://www.apcsp.gov.in/coastal-security-exercises.htm>
 - <http://www.thehindu.com/todays-paper/tp-national/tp-andhrapradesh/state-misses-out-on-marine-police-training-institute/article17670687.ece>
 - <http://www.thehindu.com/news/national/andhrapradesh/Air-enclave-for-Coast-Guard-by-2018/article17125375.ece>
- Goa
 - <http://timesofindia.indiatimes.com/good-governance/centre-Coastal-Security-Scheme-formulated-to-protect-coastal-areas/articleshow/53976348.cms> (dated July 2016)
 - <http://www.livemint.com/Politics/3Ci3r7hkW8arkOKcfLID5L/Highlevel-meet-on-coastal-security-in-Goa-on-Monday.html>
- Kerala
 - <http://www.deccanchronicle.com/nation/current-affairs/050717/centre-to-fund-kerala-to-enhance-coastal-security.html>
 - <http://economictimes.indiatimes.com/news/defence/preparedness-of-coastal-security-mechanism-along-kerala-reviewed/articleshow/54611246.cms>
 - <http://www.keralapolice.org/wings/specialized-wings/coastal-policehttp://coastal.keralapolice.gov.in/>

Way forward and challenges

- Indian Maritime Doctrine, 2016: https://www.indiannavy.nic.in/sites/default/files/Indian_Maritime_Security_Strategy_Document_25Jan16.pdf
- National Maritime Foundation: www.maritimeindia.org/
- <http://takshashila.org.in/>

International examples

France

- European Union Maritime Security Strategy (EUMSS): https://ec.europa.eu/maritimeaffairs/policy/maritime-security_en
- <http://data.consilium.europa.eu/doc/document/ST-10398-2017-INIT/en/pdf>
- <http://www.incelaw.com/tw/knowledge-bank/following-terrorist-threats-a-new-french-law-strengthens-maritime-security-mechanisms>

Japan

- Japan Maritime Self Defence Force: <http://www.mod.go.jp/msdf/formal/english/>
- Japan Coast Guard: <https://www.japantimes.co.jp/news/2017/07/18/national/politics-diplomacy/japan-host-first-meeting-world-maritime-security-leaders-abe/#.WZq98VUjHIU>

Russia

- Russian Maritime Security Service: <http://www.msecurity.ru/eng/>
- <http://isnblog.ethz.ch/maritime-security/the-two-levels-of-russias-south-china-sea-policies>
- https://www.rbth.com/defence/2017/01/19/after-decades-of-neglect-russia-strengthens-coastal-defenses-in-the-arctic_684366

UK

- <http://www.independent.co.uk/news/uk/home-news/border-patrol-boats-royal-navy-seas-coastline-worryingly-low-number-people-smugglers-a7169376.html>
- <https://www.gov.uk/government/news/new-powers-to-strengthen-coastal-security>
- National Maritime Information Centre: <http://www.recaap.org/Portals/0/docs/NMIC-information-booklet.pdf>

US

- Marine Security Guard Battalion on GlobalSecurity.org
- Powers, Rod. Marine Corps Security Guard Duty. About.com.
- Marine Security Guard Battalion on specialoperations.com
- <http://www.mcesg.marines.mil/>
- <https://www.state.gov/m/ds/rls/c17244.htm>
- https://www.cbp.gov/sites/default/files/documents/csi_brochure_2011_3.pdf
- <http://www.cbsa-asfc.gc.ca/prog/fast-expres/about-a-propos-eng.html>



8

Glossary



A&D	Aerospace and defence
ACV	Air cushion vessel
ALH	Advanced light helicopter
AR	Assam Rifles
ATV	All-terrain vehicle
BEL	Bharat Electronics Ltd
BOOT	Build, own ,operate and transfer
BPR&D	Bureau of Police Research & Development
BSF	Border Security Force
CCP	Coastal checkpoint
CCC	Coastal Control Centre
CHSS	Centre for Human Security Studies
CEZ	Coastal economic zone
CGHQ	Coast Guard Headquarters
CIP	Community interaction Programme
CISF	Central Industrial Security Force
CRPF	Central Reserve Police Force
CMO	Customs Marine Organisation
COP	Coastal outpost
CPS	Coastal police station
CPSU	Central public sector undertaking
CSG	Coastal Security Group
CSN	Coastal Surveillance Network
CSO	Company Security Officer
CSP	Coastal Security Police
CSS	Coastal Security Scheme
C-TPAT	Customs-Trade Partnership Against Terrorism
DAC	Defence Acquisition Council

DAT	Distress Alert Transmitter
DGLL	Directorate General of Lighthouses and Lightships
DGPS	Directional GPS
DF	Direction finder
DRDO	Defence Research & Development Organisation
DNCO	Directorate of Net Centric Operations
EEZ	Exclusive economic zone
EUMSS	European Union Maritime Security Strategy
FAC	Fast attack craft
FAST	Free and Secure Trade
GIFS	Gujarat Industrial Security Force Society
GMB	Gujarat Maritime Board
GPS	Global position system
GoI	Government of India
IB	Intelligence Bureau
ICG	Indian Coast Guard
IMAC	Information Management and Analysis Centre
IMO	International Maritime Organisation
ISPS	International Ship and Port Facility Security
ISRO	Indian Space Research Organisation
ITBP	Indo-Tibetan Border Police
JMSDF	Japan Maritime Self-defence Force
JOC	Joint Operations Centre
KPT	Kandla Port Trust
LBA	Land Boundary Agreement
LRIT	Long Range Identification and Tracking
MFID	Marine Fishers Identity Card
MHA	Ministry of Home Affairs
MoD	Ministry of Defence
MoF	Ministry of Finance
MoS	Ministry of Shipping
MPTI	National Marine Police Training Institute
NATGRID	National Intelligence Grid
NCB	Narcotics Control Bureau
NCC	National Cadet Corps

NCETIS	National Centre of Excellence in Technology for Internal Security
NC3I	National Command Control Communication Intelligence
NCSC	National Coastal Security Corps
NCSMCS	National Committee for Strengthening Maritime and Coastal Security
NDC	National Data Centre
NMFD	National Marine Fishers Database
NMIC	National Maritime Information Centre
NSG	National Security Guard
OCTOPUS	Organisation for Counter Terrorist Operations
OJT	On-job training
PCA	Permanent Court of Arbitration
PPP	Public-private partnership
PSS	Physical Shore Station
RCC	Regional Control Centre
RDE	Radiological Detection Equipment
SCI	Shipping Corporation of India
SDC	Sagarmala Development Company
SEZ	Special economic zone
SLC	State Level Committee
SMSC	State Maritime Security Committee
SOLAS	Safety of Life at Sea
SOP	Standard operating procedure
SOSUS	Sound Surveillance System
SSAS	Ship Security Alert System
SPG	Special Protection Group
SSB	Sashastra Seema Bal
TALOS	Technical Aspects of Law of Sea
TBPA	Transboundary protected area
UNCLOS	United Nations Convention on the Law of the Sea
UT	Union territory
VHF	Very high frequency
VTMS	Vessel traffic management system

FICCI Security Department

9

FICCI has many specialised committees where key concerns of the industry are debated and discussed with the specific aim of presenting the recommendations to the Government for favourable decisions.

Considering internal security is the backbone of growth and overall development of a nation, FICCI has constituted two specialised committees to look into various aspects of security –

- Committee on Homeland Security (HLS) is chaired by Mr. G. K. Pillai, Former Union Home Secretary, Govt. of India, which is working towards bridging the gap between policing and technology.
- Committee on Private Security Industry (PSI) is chaired by Ms. Manjari Jaruhar, Former Special DG – CISF, Govt. of India. The committee has been advocating for key policy issues confronting the industry.

Some of the focus areas:

SMART Policing: FICCI has instituted the first ever SMART Policing Awards in India for best practices in SMART Policing, with the objective to promote initiatives taken by the Police for the safety and security of Indian citizens. This can change public perception and build positive and progressive image of the police among people. FICCI SMART Policing Awards provide a platform to police officials across India to learn from the experiences of other states and also for possible adoption of the best practices to further enhance policing in their respective states.

Police Modernisation: FICCI is working towards bridging the gap between policing and technology. We engage with various enforcement agencies and provide them a platform to interact with industry, to articulate their requirements and to understand new technologies for security. This initiative is under our umbrella theme of “*Modernisation of India’s Internal Security Mechanism*”.

Smart Border Management: FICCI is working towards addressing the emerging challenges faced by India in smart border management, by bringing stakeholders together to discuss how India can create smart borders that, on the one hand, allow enhanced trans-border movement of peoples, goods and ideas, and on the other, minimise potential for cross-border security challenges.

Road Safety: United Nations has proclaimed 2011-20 as the Decade of Action on Road Safety. FICCI feels that the Indian Industry can play a significant role in addressing the issue of road safety and will be promoting potential private sector interventions in Road Safety through their core business activities.

Indian Unmanned Aerial Vehicle (UAV) Policy & Regulations: FICCI has set-up Working Groups in areas of: (a) enabling regulations for developmental use of UAVs, and prevention of rouge UAVs; (b) framework for permission and licencing for manufacturing of UAVs; and (c) technological structure for detection and neutralisation of unidentified UAVs. FICCI has recently submitted its preliminary suggestions and recommendation for Indian UAV Policy & Regulations to the NITI Aayog, Ministry of Home Affairs and Directorate General of Civil Aviation.

Policy for Public Procurement in Internal Security: FICCI is working towards advocacy for bringing well-defined procedures for fair and transparent procurement of security products and solutions, so as to provide level playing field to the industry. Although the Central Armed Police Forces (CAPFs) and State Police Forces are guided by the same policies and guidelines for public procurement as the other government organizations, the nature and requirements of public procurement process for police forces is different from that of the general government departments. FICCI has provided policy inputs to the Government of India for numerous challenges for procurement by Internal Security forces, in the areas of policies and regulations, processes, technological advancements and capacity-building.

India Risk Survey: FICCI every year conducts survey of risk as perceived by corporates, which could affect business continuity. The objective of the report is to inform and sensitise all stakeholders about the emerging risks for a developing economy like India, so that well planned and strategic policy decisions can be made.

Security Standards and Guidelines: FICCI is working with the Bureau of Indian Standards (BIS) for creation of standards and guidelines for electronic security.

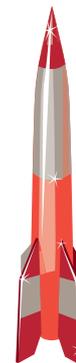
Capacity Building Programmes: FICCI has initiated capacity-building programmes and workshops as an attempt to increase awareness about Women Safety at Work Place, Forensics of Fraud Detection, White Collar Crimes, etc.

Enforcement of Private Security Agencies Regulation (PSAR) Act 2005: Major portion of the private security industry is unorganised. FICCI is advocating the proper enforcement of the Act.

Armed Security for Cash Logistics: FICCI is advocating for a well-articulated policy for deployment of armed private security guards for protection of cash vans, which carry crores of public money every day.

Private Security Workers' Categorisation as Skilled / Highly Skilled Workers: Re-categorisation notified vide a Gazette notification S.O.191 (E). Security guards without arms have been categorised as 'Skilled Workers' and Security guards with arms have been categorised as 'Highly Skilled Workers'.

Minimum Standards/Guidelines for Cash Logistics Companies: FICCI is advocating for establishment of standards and operating guidelines for cash logistics companies.



10. About FICCI

Established in 1927, FICCI is the largest and oldest apex business organization in India. Its history is closely interwoven with India's struggle for independence, its industrialisation and its emergence as one of the most rapidly growing global economies.

A non-government organisation, not-for-profit organisation, FICCI is India's voice of Business and industry. From influencing policy to encouraging debate and engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies.

FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policymakers and the international business community.

Contacts

Sumeet Gupta

Senior Director

sumeet.gupta@ficci.com

Ankit Gupta

Senior Assistant Director – Homeland Security

ankit.gupta@ficci.com

+91-99900 89493

FICCI

Federation House, Tansen Marg, New Delhi 110 001

+91-11- 23487212, 23487474

www.ficci.com

© Federation of Indian Chambers of Commerce and Industry (FICCI) 2017. All rights reserved.

The information in this publication has been obtained or derived from sources believed to be reliable. Though utmost care has been taken to present accurate information, FICCI makes no representation towards the completeness or correctness of the information contained herein. This document is for information purpose only.

This publication is not intended to be a substitute for professional, legal or technical advice. FICCI does not accept any liability whatsoever for any direct or consequential loss arising from any use of this document or its contents.



Notes

Notes

About PwC

At PwC, our purpose is to build trust in society and solve important problems. We're a network of firms in 157 countries with more than 2,23,000 people who are committed to delivering quality in assurance, advisory and tax services. Find out more and tell us what matters to you by visiting us at www.pwc.com

In India, PwC has offices in these cities: Ahmedabad, Bengaluru, Chennai, Delhi NCR, Hyderabad, Kolkata, Mumbai and Pune. For more information about PwC India's service offerings, visit www.pwc.com/in

PwC refers to the PwC International network and/or one or more of its member firms, each of which is a separate, independent and distinct legal entity in separate lines of service. Please see www.pwc.com/structure for further details.

©2017 PwC. All rights reserved.

Contacts

Dhiraj Mathur

Partner and Leader, Aerospace and Defence
+91 124 616 9604
dhiraj.mathur@in.pwc.com

Cdr. Gautam Nanda

Director, Aerospace and Defence
+ 91 124 616 9612
gautam.nanda@in.pwc.com

Nipun Aggarwal

Manager, Aerospace and Defence
+ 91 124 330 9647
nipun.aggarwal@in.pwc.com

Ruchika Verma

Assistant Manager, Aerospace and Defence
+ 91 124 330 9645
ruchika.verma@in.pwc.com

pwc.in

Data Classification: DC0

This document does not constitute professional advice. The information in this document has been obtained or derived from sources believed by PricewaterhouseCoopers Private Limited (PwCPL) to be reliable but PwCPL does not represent that this information is accurate or complete. Any opinions or estimates contained in this document represent the judgment of PwCPL at this time and are subject to change without notice. Readers of this publication are advised to seek their own professional advice before taking any course of action or decision, for which they are entirely responsible, based on the contents of this publication. PwCPL neither accepts or assumes any responsibility or liability to any reader of this publication in respect of the information contained within it or for any decisions readers may take or decide not to or fail to take.

© 2017 PricewaterhouseCoopers Private Limited. All rights reserved. In this document, "PwC" refers to PricewaterhouseCoopers Private Limited (a limited liability company in India having Corporate Identity Number or CIN : U74140WB1983PTC036093), which is a member firm of PricewaterhouseCoopers International Limited (PwCIL), each member firm of which is a separate legal entity.

KS/HS/Sep2017-10633